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Contents

Editorials 191

Electric Power in the Oil Fields 195
By H. N. CARROLL
Electricity has again proved its economy in the industrial field and has reduced drilling costs in oil well development in addition to making profitable those wells that have dropped in production.

My Job and Government Ownership 199
By ONE OF THE WORKERS
A clear analysis, as seen by one of the utility employees, of what public service employees might expect under public ownership.

Pills—Taking or Chasing Them 200
By WM. A. CYR
A dissertation on the kind of pill that always accompanies conventions.

The Indeterminate Permit 202
By JOHN A. LAING
A true definition of what a franchise really is and an outline of the necessary legislation for the proper allocation of franchise privileges.

When Government Goes Into Business 205
An outline of what has happened when public ownership was applied on a limited scale. This article should be read by every person in the electrical industry.

California's Tie-in with the Better Home Lighting Campaign 208
Under R. E. Fisher, regional director for the twelfth district, a comprehensive plan has been worked out and elaborate machinery established for the successful carrying out of this stupendous program.

The Coast Outlet 210
Dealer, Jobber and Sales Agent 216
Industrial News 218
Books and Bulletins 223
Meetings 224
Manufacturer, Dealer and Jobber Activities 225
Personals 226
Trade Outlook 228

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Where Will the Workers Come In?

WHAT do you think of the electrical industry? What do you think of your job? One of the workers in this industry of ours has set down on another page of this issue what he thinks of his present job as compared to a similar one under government ownership. His arguments are convincing and his language plain.

There are those in the industry who are not awake to the dangers which the wave of government-ownership agitation that is sweeping over several of the Western states means to them personally and to the industry. There are others similarly unaware of the menace who undoubtedly will support a presidential candidate this fall whose platform advocates government ownership. Their misunderstanding should be corrected.

The contributor of the article referred to above, in submitting his story, suggested that it be given the widest possible circulation in the industry. He remarked that he believed that his own company would desire to place a copy of it in the hands of every employee. With this suggestion we have planned to reprint the article in a handy pocket-size booklet suitable for distribution. By addressing the Production Manager of the Journal of Electricity, quotations can be secured on copies of the reprint.

We make this suggestion because we feel that no stones should be left unturned in the campaign against the measures and men who threaten the socialization of a business so vital as the production of electric light and power.

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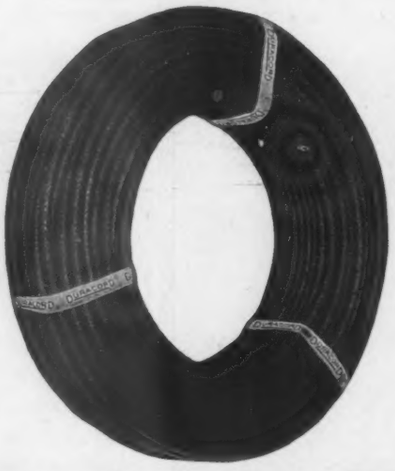

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Get Into the Game

A more constructive movement than the Better Home Lighting Campaign has never before been undertaken by the electrical industry. All branches are cooperating to make it a great success. The Lighting Educational Committee, headed by J. E. Davidson, vice-president of the National Electric Light Association, has arranged for financing the movement to the extent of $500,000 for advertising, prizes and administration expense. Here in the West the regional directors, R. E. Fisher, San Francisco, A. C. McMicken, Portland, and Clare N. Stannard, Denver, are creating their organizations and assigning duties to the local committees in their respective geographic divisions. It only remains for the power companies, electric clubs or organizations best suited to the task to cooperate with the national effort through the local committees drafted for the work.

From the standpoint of the industry this campaign offers two main benefits. In the first place it should produce better public relations, because it is purely an educational movement; and secondly, it should stimulate intelligent selecting of fixtures and produce more satisfactory service from electrical energy. From a humanitarian standpoint its benefits are multifold, for it cannot help but better the eyesight of the nation. Many a person has been instructed in the candlepower-per-watt advantage of the type "C" lamp over the type "B," but few have progressed beyond the first lesson in cost per foot-candle. A great deal of badly designed glassware is yet in use, with the result that in many places the powerful rays of the type "C" lamp are not properly controlled, so that an increasing number of cases of eyestrain is recorded. The aim of the approaching campaign is to teach this second lesson in how to use to the best advantage the type "C" lamp as well as all other types of modern lamps.

In this instance the child instead of the fixture dealer is to be the teacher, and in what better way could the idea be brought to heads of families that purchase illumination? Do not your children tell you that the fire marshal says to clean up the basement, and otherwise surprise you with good common sense teachings brought home from school? And do you not pay more attention to this kind of teaching than you do to all the volume of instruction from the press or exhortation from the pulpit? So let us prepare to harness the potential instructive energy of the millions of school children in the United States for the good of the industry and the health of the nation; and let us see to it that no community is disappointed after seeing the national advertising because no contest is to be carried on in their section. The West is said to have led the industry in many things. Let us not lag behind in this, the greatest movement of its kind ever attempted.

May we also reiterate the oft-repeated warning that this is an educational movement, not a commercial one, and that the contest must be kept on a highly ethical plane. We should be particular to prevent the lists of contestants from being used by unscrupulous dealers. The business side of the movement will take care of itself to the lasting benefit of all branches of the industry.

Oregon Becomes Inoculated

IF one rotten apple will spoil a barrel it is not to be expected that one good apple between two rotten ones could stay sound over a very long period. Oregon, long immune from the public-ownership bug although sandwiched in between California and Washington where this germ has been rampant for some time, has at last become inoculated. The disease is known as the "Oregon Water and Power Act," a constitutional amendment apparently patterned after the California Water and Power Act and the Erickson bill (proposed in Washington). The Act proposes to put the State of Oregon into the water, light and power business, giving it preferential rights over privately owned utilities.

The amendment was fostered by a local committee said to have been organized through the efforts of the Public Ownership League of America. The proposed measure represents sixteen months' work. It will be brought before the next session of the legislature with the request that it be placed before the people at the 1926 general election. If the state legislature refuses to do this or proposes to alter the Act, it will be withdrawn and placed on the ballot by initiative petition.

On another page of this issue some of the outstanding features of the proposal are discussed. Those familiar with the California Act or with the Erickson Bill will recognize some of the features of both in the Oregon measure. In some respects the

measure is even more vicious and more radical than either of the above.

It is a pity that Oregon must go through the same bitter experience of its two sister states. On the face of it, the announcement by the proponents of the bill seems a little hasty. They might at least have waited until the voters of California and Washington had voiced their disapproval of similar legislation as they are certain to do in November.

An Editorial for Electrical Contractors

AN analysis of wiring estimates has revealed that many jobs are being taken without profit, apparently in the hope that there will be "extras" or fixtures or appliances to be sold on which the contractor expects to obtain the return he did not get on the wiring. This process of reasoning is similar to that of a shoe dealer who sold shoes at cost expecting to make his profit on repairs at a later date. The situation, too, is the same—he did not get the repairs and the electrical contractor often does not get the extras. A banker does not loan money without assurance as to the return, not only of the principal but also of the interest he intends that money to earn. Why, then, should wiring jobs be taken for cost, or less? If it were sound business to use money without expectation of return, it is reasonably sure that bankers would follow that plan of action. However, banks have not been conducted along that line. Every loan must show a profit. Cannot the electrical contractor-dealer learn a lesson from the banker?

Cooperative Organizations Deserve the Support of the Industry

DENVER is collecting dividends from the money that has been invested in the Electrical Cooperative League of that city. So is the electrical industry. The third annual report of that organization, just published, shows that the League has been a decided success. Some of the definite accomplishments during the past year and the plans that have been outlined for the year to come are printed on another page of this issue. Aside from the facts regarding the contacts that have been made, the installations that have been supervised and improved, the campaigns the League has sponsored and the electric homes it has exhibited, were we to summarize the accomplishments of the League as set down in its report to the industry we would say that the organization has been responsible for

1. The creation of a feeling of mutual helpfulness in the industry and its allied interests.

2. The inculcation of a sincere and growing appreciation on the part of the public of what the electrical industry stands for.

3. A marked increase of interest in electrical matters on the part of architects, builders, realtors and the general public.

4. The spread of knowledge on the part of the industry that it has successfully discharged its obligation to educate and serve the public.

The electrical leagues are becoming the service branches of the industry. Their ability to function and prosper depends upon the extent to which the industry supports them, both financially and morally. The cooperative plan is continuous and cumulative in the development of the industry and in the furtherance of its ability to serve the public. The extent to which the industry and the individuals in it benefit is of necessity measured by the degree in which they participate and contribute to that common cause.

Contractors and Dealers and Their Conventions

ATTENTION has already been called to the annual convention of the California State Association of Electrical Contractors and Dealers to be held at Santa Cruz, Calif., Sept. 19-21. This meeting promises to be one of the most notable in its history on account of the exceptional character of the program which has been arranged. There has been a tendency in the past to treat these annual gatherings lightly, making them more of a jollification than a meeting ground for the exchange of information and ideas for the betterment of the industry in general and the contractor-dealer's place in that industry. This year specialists will address the gatherings on estimating, lighting and lighting fixtures, residence wiring, radio and credits. Men old in "the game" will relate their experiences for the benefit of the younger firms in the field. The program warrants the attendance of every contractor, dealer, manufacturer and jobber interested in this important branch of the industry. The association and its officers are to be congratulated on the forward step which has been taken in planning a convention of such a progressive nature.

Cooperation From Universities

A healthy condition, presaging the satisfactory solution of some of the problems confronting the electrical industry today, is noticed in the cooperative spirit of our state universities and colleges. There are two outstanding examples in the Northwest wherein institutions have taken a hand in the attempt to solve important problems, furnishing their organizations and the experience of their trained investigators for the task.

In Washington, the state university is taking the lead in bringing together the conflicting interests of the fishing and power industries, providing the common meeting ground for a sane consideration of the problem of taking salmon over high dams, and offering the services of Professor Cobb, the leading ichthyologist of the Northwest, to seek a solution of this problem. Experiments are under way, the results of which will have a distinct bearing on hydroelectric projects now planned but temporarily halted as well as others for future development.

In Oregon the State Agricultural College has completed the organization of the Oregon committee on the relation of electricity to agriculture, to cooperate with the N.E.L.A. movement, and has commenced a series of surveys of the farming districts of the state to determine to what extent such districts are electrified and what are the possibilities of their further electrification. The results of these surveys will be helpful both to the utility planning rural extensions and to the farmer demanding service, and will provide the basis of a more comprehensive understanding of the question by both parties. Professors McMillan and Gilmore have been released from university duties to carry on these surveys, and again we have evidence of the desire of President Kerr, with such associates as Professor Dearborn and Director Jardine, to attack the practical economic problems of the day.

This tendency in our institutions of higher learning is highly commendable. The old-school college professor, the type about which Harry Leon Wilson is writing so delightfully in the Saturday Evening Post—the type that lives in a purely academic atmosphere entirely surrounded by books—is rapidly passing out of the picture, and in his place we find the professor who is anxious to take part in the daily economic struggle of modern business. Such a professor must necessarily impart to the undergraduate much of the knowledge he absorbs through contact with the workaday world and a study of its problems, and thus we are assured that our own boys, and the young men we hire, will come out of college with a mental equipment in political economy beyond that to be gained solely from a study of our old friends (?) Adam Smith, John Stuart Mill, et al. What an admirable counter-irritant to the socialistic tendency that threatens the industry today! How well spent is the dollar paid in taxes for the support of our state universities and colleges!

Politics and Power Systems

FROM a part of the country where certain elements of the people apparently have gone wild over government-owned power systems, comes another municipal project, a late development of which is treated in the news columns of this issue. We are not surprised at this, nor even grieved, since we feel, now that the project is halted at least temporarily, that reason eventually will prevail. Our reference is to the proposed project of the city of Aberdeen, Wash., on the Wynooche River.

Without accusing anyone of bad faith, and without attempting to present a brief for the Grays Harbor Railway & Light Company, we are constrained to comment on the case primarily because we are known to be against municipal ownership and operation as a principle. Because we believe in just emolument to capital, because we believe in the stimulus to growth produced by the hope of reasonable compensation to private initiative, and because our faith in private ownership is daily strengthened through contact with the men that are running our utilities of the West, we continue to hope for sanity in government.

What does Aberdeen, a city of some 18,000 population, want with a $2,000,000 power system? Why saddle itself with this debt, assuming the project could be completed for this amount—which seems doubtful—primarily to produce 34,000 hp. of energy in a community that now has a peak requirement of less than 5,000 kilowatts? We say "primarily" because, though the project includes a subsidiary water supply, it is pointed out by opponents of the scheme that for not more than $250,000 the present water supply can be improved and conserved so as to take care adequately of the city's requirements for many years. What, therefore, do the taxpayers, who have already taxed themselves for public improvements to the heroic extent of 100 mills, want with a seemingly over-developed power system? There is no apparent shortage of power in Aberdeen. The power company seems to be meeting all demands at reasonable rates, and is ready to develop additional hydroelectric power as soon as the need arises and as soon as a project is found that will deliver energy to the city at a cost comparable with the present cost of steam power generated from hogged-fuel. The thought cannot be driven home too often that waste lies not in allowing the water to run unmolested down hill, but in over-development of rivers with too costly projects.

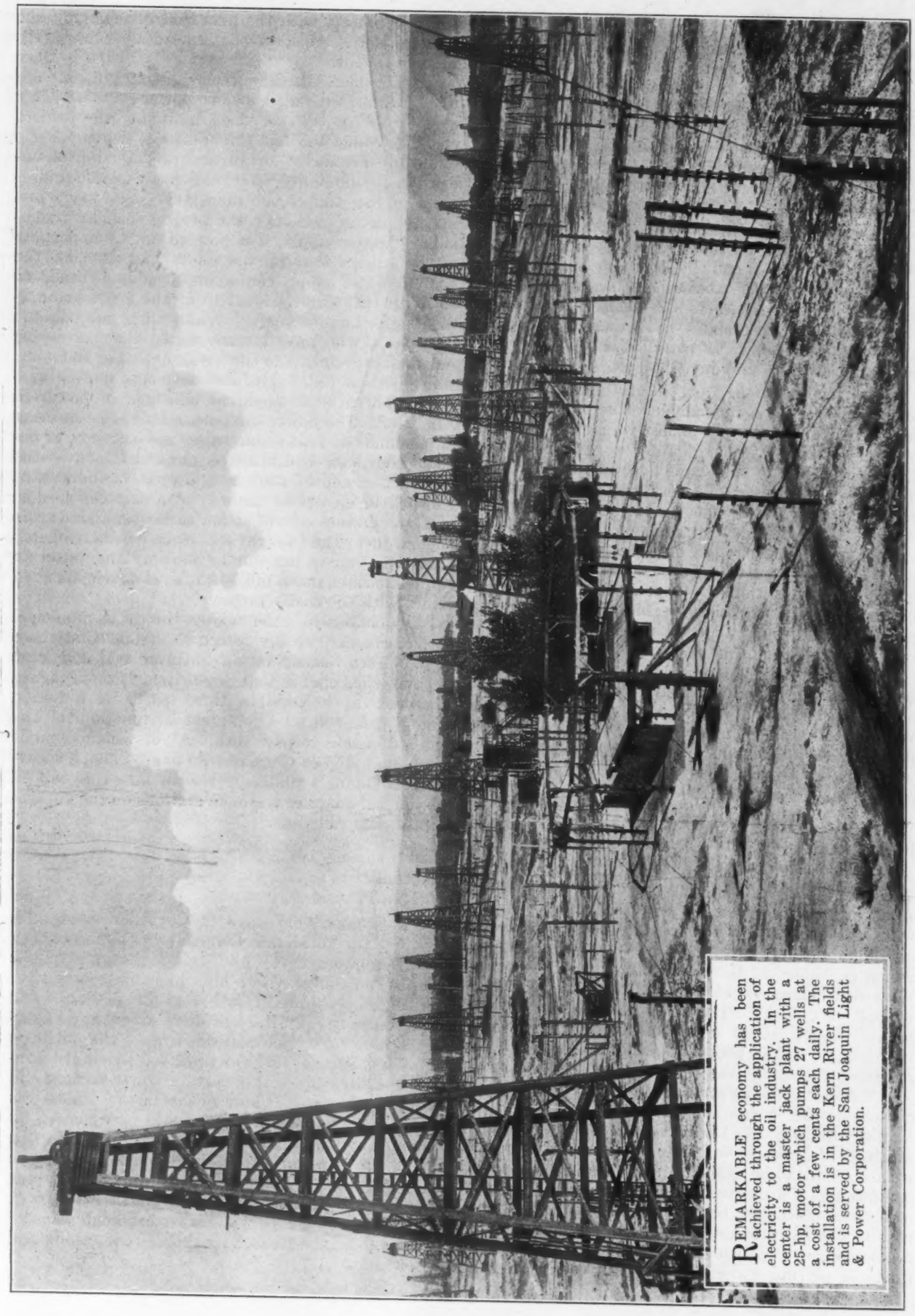
In looking for the motive in these municipal power schemes, we are forced to assume that there is a political consideration involved. In the case in point, the belief is that Seattle and Tacoma regard Aberdeen as a possible third party to a tied-in system that will fill a job-creating function for the political quacks to play with. All of which reminds us of the indigent German who finally landed a government job as a "listener" for the man that tapped the journal-boxes of trains at stations on the government-owned railroads.

The Public Be Pleased

IN the "good" old days of Cornelius Vanderbilt, before the Interstate Commerce Commission and state regulation came into being, the great public utilities ran things with a high hand. Starting with the "Big Boss," himself, and from him down the line to the office boy, an insolent don't care-a-hang bearing characterized their attitude toward the public.

As evidence of how far times have changed, consider the situation with a certain power company in Colorado, as told elsewhere in this issue. There was a vacancy in the position of general manager. Two communities, through their citizens, took up the cudgels in favor of the resident manager in each community in urging his appointment for the vacancy, and this without the slightest attempt at campaigning on the part of either candidate.

The public-be-pleased idea means something real in Colorado.



REMARKABLE economy has been achieved through the application of electricity to the oil industry. In the center is a master jack plant with a 25-hp. motor which pumps 27 wells at a cost of a few cents each daily. The installation is in the Kern River fields and is served by the San Joaquin Light & Power Corporation.

Electric Power in the Oil Fields

By H. N. Carroll

Sales Department, San Joaquin Light & Power Corporation, Fresno, Calif.

RECENT development in the oil fields, notably the diminution of gas pressure and flow, has brought the application of electricity to the fore in drilling and pumping. A survey of the oil wells in the territory served by the San Joaquin Light & Power Corporation shows that the cost of electric power for pumping is considerably less than steam or gas engine drive, and that electricity has many advantages for drilling.

THE electrification of California oil fields is not the result of clever sales propaganda or super-sales effort. The fact that the whine of the motor has, to a great extent, replaced the staccato exhaust of the gas engine is due to the proven efficient and economical operation of motors over other methods of drive. The motor has "sold itself" on its ability to perform all oil field operations of the engine drive and to perform them at a lower cost.

The first oil well motors used in the California fields were purchased by the Good Luck Oil Company of Coalinga in July, 1910. This installation was made only after a year's hard work by engineers, electrical salesmen and power salesmen, in perfecting a properly adapted motor to the degree where the manufacturing company felt safe in putting it on the market.

The oil field operators were naturally skeptical as to the ability of the motor to perform as the salesmen claimed it would. They wanted actual operating conditions and costs proved, and it was not until the summer of 1911 that any other contract of any consequence was signed.

The change from the old engine drive to motors has gone ahead very rapidly since 1911, however, in fields where electric power is available. This is especially true in the older fields where decreasing production has made economy of operation a deciding factor in the life of wells. There have been many cases where wells that could no longer be pumped at a profit by engine drive have been changed to motor drive and are still being pumped at a profit today.

While the most important use of electric power is in drilling and pumping wells, it is being extensively used to drive water pumps, gathering and line pumps, vacuum pumps, compressors and circulating pumps for gasoline plants. Also it is being used for dehydrators, for arc welding equipment for pipe-line and tank construction, for motor drive for machine shops, and for general lighting.

A recent survey of the oil field business being served by the San Joaquin Light & Power Corporation shows that the operators, superintendents and men in these fields have been sold on the electrical idea on costs only. The days when it was necessary to talk convenience and safety, and touch lightly on the cost of operation, to make power sales have passed.

With the increased business in these fields and the resultant improvement in distribution service, there are very few cases where motor drive will not show a decided saving in the cost of operation over other methods of drive.

Motors were used at first only to pump oil wells, but upon conclusive ability of the motor to perform all oil field operations of the engine drive and to perform them at a lower cost, the entire industry is rapidly being motorized.

In this survey, it was found that there were no

Table I. Cost of Electric Pumping with Individual Motor Drive

No. Motors	Total Hp.	No. Wells	Average Depth Feet	Average Monthly Production Barrels	Average Monthly Kw-hr.	Average Monthly Bills	Kw-hr. per Well per Day	Kw-hr. per Barrel	Cost per Well per Day	Cost per Barrel
11	67	11	650	1,950	20,704	$ 289.50	62.7	10.6	$0.877	$0.145
2	20	2	660	1,000	5,604	78.45	93.4	5.6	1.307	0.078
11	165	11	800	10,500	26,272	334.50	79.6	2.5	1.013	0.032
8	120	8	800	3,200	24,088	337.23	100.3	7.5	1.407	0.106
3	45	3	800	1,350	10,248	143.47	113.8	7.5	1.594	0.106
3	45	3	925	2,000	16,047	224.64	178.3	8.0	2.496	0.112
2	20	2	980	1,800	4,786	67.00	79.7	2.6	1.116	0.037
19	285	19	1,000	7,300	60,006	838.69	105.3	8.2	1.471	0.114
12	180	12	1,000	5,200	17,635	246.90	48.9	3.4	0.686	0.047
27	405	27	1,000	25,000	84,495	1,182.94	104.3	3.4	1.460	0.047
10	100	10	1,100	8,200	20,462	286.47	68.2	2.5	0.954	0.035
15	225	15	1,150	21,000	57,200	800.08	127.1	2.6	1.777	0.038
13	195	13	1,200	27,500	36,575	547.05	93.7	1.3	1.403	0.019
3	30	3	1,200	2,000	12,036	169.35	133.7	6.0	1.881	0.085
2	30	2	1,250	1,500	11,812	165.37	183.5	7.8	2.756	0.110
35	360	35	1,500	27,000	139,192	1,323.50	132.5	5.1	1.260	0.049
17	255	17	2,000	25,500	82,000	925.86	160.8	3.2	1.815	0.036
3	45	3	2,400	6,600	10,660	149.24	118.4	1.6	2.658	0.023
3	45	3	2,733	5,250	13,140	183.96	146.0	2.5	2.044	0.035
4	80	4	3,150	14,100	20,769	370.25	173.0	1.4	3.085	0.026
203	2,717	203	318,054	204,150	673,731	$8,664.45	.....	.....	.....	.....
Averages			1,571	1,005	3,319	$433.22	110.6	3.3	$1.422	$0.0424

installations where the current consumed was used for any one given oil field operation. In practically all cases the current supplied was being used for line pumps, machine shops, or drilling motors, as well as pumping wells, and it was impossible to get an average cost for pumping over the entire field. The 20 installations used in Table I were not selected in an effort to prove a case for motor drive, but for the reason that in these cases the current consumed was not used for any purpose other than pumping and lighting.

Table II shows power cost data on the operations of jack plants in the Midway fields. The data were obtained in the same manner, and also include lighting on the various leases.

Motors having been used longer for pumping purposes than any other form of operation, it is very easy to obtain authentic cost data for this method of drive. The following results of a test made by one of the largest producing companies in the Midway fields show some very interesting comparisons in the cost of pumping oil wells with three different methods of drive. This test was made over a period of eight months' time and included labor, repairs, fuel oil, hauling, etc., but did not include interest on the investment or depreciation on equipment, which would tend to further increase the favorable showing made by the motors.

The Kern River field is one of the oldest of California's oil fields and is rather shallow. This, together with the fact that the wells in this field are of low and uniform production and are in certain sections of the field of uniform depth, offers ideal conditions for jack plant operation which obviously requires that wells be pumped at the same number of strokes per minute and the same length of stroke.

A great many companies in this field are pumping on the same leases with both individual motors and with jack plants and as a result it was difficult to ascertain power costs on the two methods of operation for the entire field as the current was almost invariably metered through one meter.

	Equipment	Horsepower	Duty	No. of Wells	Cost per Well per Day
1	Gas Engine	50	Jack Plant	23	$1.23
31	Motors	15–30	Individual Pumpers	31	1.59
26	Gas Engines	25	Individual Pumpers	26	2.42
	Steam	.....	Individual Pumpers	15	6.00

Two of the larger companies operating on the P-5 schedule showed the following power costs for pumping wells with individual motors.

Table II. Cost of Electric Pumping with Jack Plants in Midway Fields

No. Motors	Hp.	No. Wells	Depth Feet	Average Monthly Production Barrels	Average Monthly Kw-hr.	Average Monthly Bills	Kw-hr. per Well per Day	Kw-hr. per Barrel	Cost per Well per Day	Cost per Barrel
1	30	13	290	1,650	5,448	$ 76.27	13.9	3.3	$0.190	$0.0462
1	40	26	600	8,950	23,352	325.53	29.9	2.6	0.417	0.0333
1	15	6	700	1,800	2,714	37.99	15.0	1.5	0.211	0.0211
1	90	26	700	12,600	17,339	248.35	22.2	1.3	0.364	0.0225
2	115	29	1,000	12,180	17,797	249.16	20.4	1.4	0.284	0.0204
1	30	5	1,100	4,200	7,216	101.02	48.1	1.7	0.673	0.0139
1	75	16	1,250	3,748	13,604	190.46	28.4	3.5	0.396	0.0508
1	40	10	1,357	1,000	10,934	153.10	36.4	10.9	0.310	0.1530
9	435	131	109,840	46,128	98,404	$1,381.88	.....	.....	.....	.....
Averages			838	351	10,933	$153.54	25.0	2.1	$0.352	$0.0299

The cost per kilowatt-hour in the case of these consumers is 9½ mills and the power cost per well per day of approximately $1.32 makes an excellent showing for motor drive.

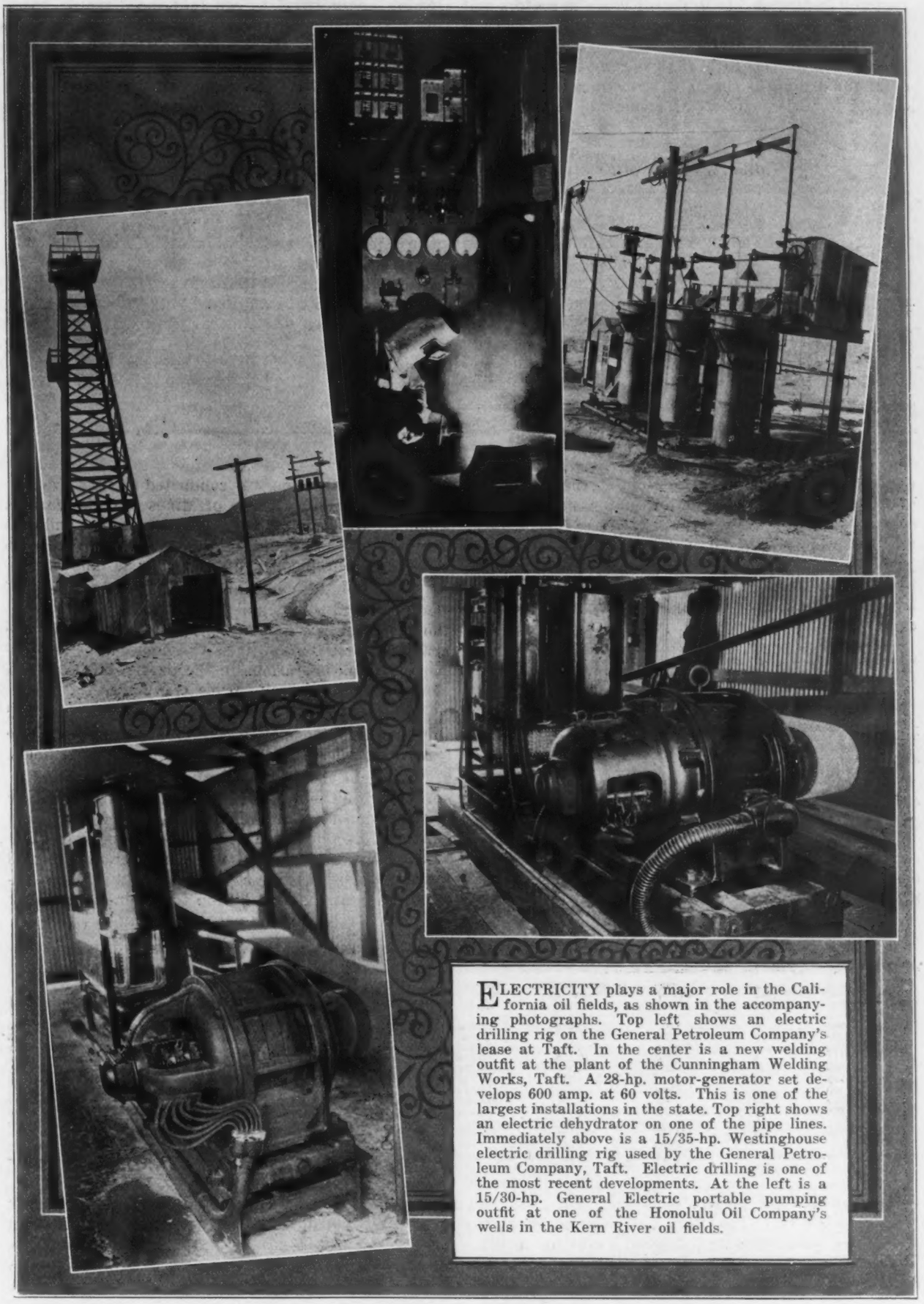
The data on power costs for jack plant operation in Table IV show remarkably low operation costs for this form of drive. These data were selected at random from a survey of the entire field to show as nearly as possible average conditions and not with the idea of proving a case for motor drive.

Table III. Cost of Electric Pumping with Jack Plants in Kern River Field

No. Wells	Average Monthly Production Barrels	Monthly Kw-hr.	Monthly Bill	Kw-hr. Per Well per Day	Kw-hr. per Barrel	Cost per Well per Day	Cost per Barrel
67	30,000	284,200	$2,642.60	142.4	9.5	$1.314	$0.088
207	142,823	856,832	8,197.20	137.9	5.9	1.320	0.056
274	172,823	1,141,032	10,839.80	.....	.....	.....	.....
Averages				138.8	6.6	$1.318	$0.062

In the Santa Maria fields, with a greater average depth per well and a greater viscosity, but with a slightly higher average monthly production, the kilowatt-hour consumption per barrel of oil produced is exactly the same as the average in the Midway fields and the slight difference in cost per barrel is merely the reflection of the difference in power rates in the two fields. Cost data on this field are shown in Table V.

The old objection that motor drive was not sufficiently flexible for drilling purposes has been over-



ELECTRICITY plays a major role in the California oil fields, as shown in the accompanying photographs. Top left shows an electric drilling rig on the General Petroleum Company's lease at Taft. In the center is a new welding outfit at the plant of the Cunningham Welding Works, Taft. A 28-hp. motor-generator set develops 600 amp. at 60 volts. This is one of the largest installations in the state. Top right shows an electric dehydrator on one of the pipe lines. Immediately above is a 15/35-hp. Westinghouse electric drilling rig used by the General Petroleum Company, Taft. Electric drilling is one of the most recent developments. At the left is a 15/30-hp. General Electric portable pumping outfit at one of the Honolulu Oil Company's wells in the Kern River oil fields.

come by improvements in recent years in motors and controls and it is becoming the most popular method of drive for this purpose.

It is a proven fact that the motor method of drive for drilling is the most economical method yet devised for this purpose. One company, at the present time drilling in thousand-foot territory in the Midway fields with a 15-35-hp. motor shows power costs of approximately 15 cents per ft. of hole drilled, or an average power bill of $150 per well.

The Pinal Dome Oil Company shows the following costs on three wells drilled with a motor, a gasoline engine and a steam engine, as the methods of drive.

	Union Annex No. 1 Electric Motor	Means No. 1 Gasoline Engine	Devlin No. 1 Boiler and Steam Engine
Total Depth of Hole	5,108 Ft.	5,208 Ft.	3,955 Ft.
Average Cost for Power, per Foot Drilled	$0.8211	$0.8546	$2.491
Average Expense per Hour of Operating Time for Expense of Labor and Material Including Power, but not Including Depreciation	$4.7767	$7.6480	$6.7326
Average Cost per Operating Hour for Power	.4065c	.8352c	.9376c

In cable tool drilling motors have already demonstrated a decided superiority over other prime movers but in rotary drilling, until quite recently, steam has been the preferable power. This was due mostly to the fact that there had been no effort to change the main equipment beyond the prime mover. The remainder of the equipment, having been designed for steam with its greater flexibility, did not readily adapt itself to constant-speed motor operation. This fault is being rapidly overcome in the more recently designed rotary outfits and there is no reason to suppose that as more study is made of this problem electricity will not to a great extent replace steam as the prime mover in rotary drilling.

Table IV. Cost of Electric Pumping with Jack Plants in Kern River Field

No. Wells	Depth Feet	Average Monthly Production Barrels	Average Monthly Kw-hr.	Average Monthly Bill	Kw-hr. per Well per Day	Kw-hr. per Barrel	Cost per Well per Day	Cost per Barrel
5	950	800	2,370	$ 33.25	15.8	2.96	$0.220	$0.0415
6	750	1,000	1,770	25.55	9.8	1.77	0.144	0.0255
6	600	500	2,946	41.29	16.4	5.89	0.229	0.0826
17	600	800	3,424	47.94	6.7	4.28	0.094	0.0599
22	380	1,340	5,222	73.10	7.9	3.89	0.110	0.0546
13	1,000	5,000	8,520	119.37	21.8	1.70	0.306	0.0238
8	1,000	3,000	4,170	86.42	25.7	2.06	0.360	0.0288
12	1,180	2,422	6,590	92.26	18.3	2.72	0.256	0.0381
18	950	3,000	7,660	107.24	14.2	2.55	0.198	0.0357
32	740	5,000	12,508	174.64	13.0	2.50	0.182	0.0349
4	950	2,700	9,208	128.90	76.7	3.41	1.070	0.0477
22	750	1,566	7,170	100.42	10.8	4.58	0.152	0.0641
227	650	32,192	93,300	950.60	13.7	2.89	0.139	0.0295
392		59,320	166,858	$1,980.98				
Averages	702	.....	.....	.....	14.2	2.81	$0.168	$0.0334

An investigation was conducted in 1922 by engineers of the State Bureau of Mines into the various kinds of power equipment in use for drilling and producing oil wells, in California fields. The final conclusion as contained in this report is as follows:

"Due to the development and improvement of electrical equipment and the construction of additional hydroelectric power plants, together with the necessary distribution lines, the time is not far distant when all operations in the proven oil fields will be carried on by means of electric power."

This prediction is rapidly becoming a fact and the conversion to motors will take place even more rapidly as the gas flow diminishes in the older fields.

Many of the oil fields now under development or survey are either already in territory traversed by high tension lines or are so situated that they may be served electrically at slight expense for line extensions. Thus a profitable source of revenue is opened to central stations having oil fields within their distribution area for, in addition to drilling, electricity is also being used for pumping on those wells that have ceased to flow or where the flow has dropped below commercial production. This is generally twenty-four hour load and is attractive both from a load and a revenue standpoint.

Table V. Cost of Electric Pumping with Jack Plants in Santa Maria Field

No. Motors	Total Hp.	No. Wells	Average Depth Feet	Average Monthly Production Barrels	Average Monthly Kw-hr.	Average Monthly Bill	Kw-hr. per Well per Day	Kw-hr. per Barrel	Cost per Well per Day	Cost per Barrel
26	390	26	1,633	21,630	134,300	$2,044.50	172.2	6.2	$2.621	$0.094
4	60	4	2,560	6,750	19,740	296.10	164.5	2.9	2.467	0.044
7	105	7	2,868	14,520	20,400	306.00	97.1	1.4	1.457	0.021
8	120	8	2,600	20,250	40,076	601.14	166.9	1.9	2.504	0.029
22	330	22	1,439	18,995	124,824	1,822.86	189.2	6.5	2.762	0.096
12	180	12	3,071	18,930	39,938	757.32	110.9	2.1	2.103	0.040
4	60	4	2,900	7,800	19,048	285.72	158.0	2.5	2.381	0.037
42	658	42	3,264	41,292	118,886	1,628.23	94.3	2.8	1.292	0.039
19	285	19	2,355	29,191	78,478	1,184.65	137.7	2.7	2.078	0.046
144	2,188	144	355,517	179,358	595,690	$8,926.52	.....	...	.....	.....
Averages			2,469	1,247	4,136	$62.04	137.9	3.3	$2.068	$0.049

My Job and Government Ownership

By One of the Workers

WHAT sort of a show do I stand under government ownership? I am just an ordinary employee, one of the thousands of us who seem to be necessary somehow to give utility service in spite of the bunk about "the waters of the Sierras are the natural heritage of the people."

Just where do I come in, anyway? Kind of a selfish question, maybe, in view of the high-sounding ideals spoken by these chaps who advocate government ownership. But I still have to eat and so does my little family, and I seem to be necessary,—that is, someone seems to be necessary, and it might as well be me—to do my little bit for the rendering of electric service.

It is a question—selfish or not—which has led me to study into this proposition of government versus private operation pretty thoroughly. You see, if it was going to affect my job, I wanted to know about it. If it held any rosier promises to me than the present arrangement, I wanted to know that, too, so that I could favor any such measures. But if it didn't offer any improvement on present conditions, why bother with all this fuss about government ownership of one kind or another, thought I.

Laying aside all those other phases of the subject—taxation, rates, financing, high salaried executives, and all the things debated upon by the pros and cons—I think I've found out a few things that any other employee like myself might like to think about. Not that I couldn't write at length on those subjects too, after this study I've made,—I could write a book—but let's just get down to brass tacks on the meal ticket question alone.

What about my job then?

Pretty good. My chances for a job will be about as good as they ever were. There will be plenty of jobs, never fear. I've never seen a government or political enterprise that didn't need as many if not twice as many jobholders as a private enterprise.

Changing over an electric system from private to political management will still necessitate the employment of men and women to make the thing go. Politicians may step in to replace managers, but the fellows who know kilowatts and power factor will still be useful. Someone will still have to strap on spurs to climb the 40's. Someone will have to set meters and somebody else read them. So I'll take chances with my job, as far as just plain job goes.

How about pay?

Well, I don't see that pay will be affected much, either. The best theories and plans still call for human beings to make things run. It's more than likely that they will be run by pretty much the same kind, if not the same people, that now do the dirty work. And pay for skilled workmanship won't fluctuate much. All these "untold benefits" that are promised from reduced operating costs will remain "untold," I'm afraid, on this score.

Changing the titles of utility men and women won't change human nature. They won't be more saintly or honest nor will they be wizards able to perform miracles because they work for the state. And they'll still have to eat, even if they do work "for the people." Aren't they working for the people now?

But what about individual opportunities under government-owned projects? Not so good!

I won't say that there won't be opportunities for the bright young man or woman. In fact, from what I've seen of politics, a little judicious boot-licking is good for the pull. But then, I suppose some of that is true under any sort of management. Remember, it would be just about the same people running things in any event.

Yet there is something about the very institution of government itself that is mighty cold-blooded and mechanical. I learned that in the army. Human beings are useful as tools, but there is seldom if any personal interest in an employee. Corporations used to be that way too, but show me one today that isn't alive to the fact that personnel cooperation is the chief asset for success and I'll show you a corporation that will be on the rocks if it doesn't "snap out of it."

My company, and I say it with pride, provides me with free insurance against death or disability, old age retirement on pension, a club room where I can meet my cronies or shoot a game of pool. It helps out in employee parties and picnics, provides sports for leisure hours and a library and classes available for my self-improvement if I want them and makes me feel like a mighty important brother in a big, cheerful family. I have yet to hear of such welfare work among any government employees.

Good business for the company? Sure it is! I'm civil to customers because I'm in a happy frame of mind. And I do better work for knowing that I'm well cared for. I'll willingly grant the company **good business** on that kind of a deal.

That's just the trouble with government. It doesn't care whether it does "good business" or not. It exists to do the least possible, it seems, to satisfy its people. That's why that terrible lassitude, that spirit of do-as-little-as-you-can-get-away-with creeps into it, in spite of anything you can do.

We're fortunate, in my town, to have a very sincere man as mayor—an engineer and a humanitarian. When he came into office he noticed the extreme indifference of all city employees to their work, to the public, even toward each other. His secretary, a friend of mine, told me how hard the mayor tried to put some interest and cooperation into the organization and how hopeless it was. Why?

Because no matter what a city employee does he can't get a raise for it. What good does it do him to improve? He is under civil service—under contract to do a certain job a certain way for a certain time. If he wants to advance he has to take an examination and then be put on the waiting list for

an opening in the next job ahead of him. Better work won't earn him anything. Why bother, then? They can't fire him without a lot of rigmarole and they have to prove he's rankly incompetent to do it.

And yet civil service is a necessary evil. It protects the taxpayer and the employee too from politicians placing altogether incompetent men in responsible jobs just because they have "pull." But for all that, civil service does clamp handcuffs on an employee's originality and initiative.

Where I work—a private utility, so-called—the fellow who works hard, studies, is loyal and makes good is rewarded in pay and advancement. There is some incentive to do better work. Civil service employees can't be advanced without breaking up the whole theory of civil service.

My boss started out as a salesman. The chief engineer started as a stoker. Even the office boys are nabbed off for good jobs as soon as they show signs of ability. I have some ambition myself to be one of the main squeezes of the works some day, and it's entirely up to me whether I get there or not—and I like that about my job.

But suppose I did get a managerial job for a politically operated utility. Do you suppose, no matter how sincere I was, that I could altogether ignore popular clamor for some particular plan, or scheme or proposal, regardless of whether it was, from an engineering standpoint, the best thing to do? I might—but I'd lose my job next election if I did.

We have a postmaster here in my town who has done more for postal service than any single man in years. By means of weekly letters to business men, he has educated them to the advantages of early mailing, and other things which make life easier for his very inadequate force of postal clerks and increases their efficiency. But he is apt to lose his head next election, just as he got his job the last one. What will become of his good work in that case—I don't know.

Then, too, there's the matter of equipment. No man can do his best work with poor tools and to see the antiquated methods and equipment used at the post office and the court house and city hall is enough to make me weep. Advocates of this public ownership bug like to point to the post office as a successful government operation. But who will say that it is successful from the point of view of the employee? Poor dubs haven't had an increase in pay in years, with costs of living going up all the time.

And what's worse, **just because they are government employees, they are forbidden by law from working in their own behalf for an increase in salary.** No thanks!

I'm not very much of a capitalist, yet I do own a share of stock in my company, and I'm buying another on easy payments. It isn't much, but it means a lot to me. I feel that I belong to the outfit and that the outfit kind of belongs to me. And the pride of being one of the owners in this enterprise is a real joy. I suppose I also am a part owner of our city water system, because I pay taxes on it and all that, but it doesn't feel the same. It doesn't do anything but assess me, for one thing, and then I can't cash in on it if I leave the city. It isn't an asset, it's a liability. And a municipal power plant would be the same.

Seems to me that the socialists talk a good deal about "the machinery of production" being owned by the producers. Well, that's what I'm doing, isn't it, with my share of stock? That seems to me to be the real way to accomplish this ideal.

Certainly, turning industry over to government is the last way to expect the workers to ever own the "machinery of production." The customer-ownership idea is a lot sounder and there isn't any doubt about it's being better for the employee,—to which class I proudly belong. And so does my general manager, because, you see, he's working for me since I became one of the owners.

Pills—Taking or Chasing Them

Golf—the First Byproduct of Conventions

By Wm. A. Cyr

GOLF, I can well imagine, was invented by a dour Scot with a sardonic sense of humor. "A'll mek me a game nerra a one like it in the wurrld," I can see the old boy chuckle, biting a corner off his briar pipe-stem for emphasis.

Then the old gent proceeded to turn all accepted sports upside down. Golf resulted.

For it's a game that spreads itself over 60 acres, instead of a mere gridiron or diamond. And the bleachers have to walk along with the players—only a Scot could have conceived such a mischievous arrangement. Then, instead of having someone else chase the ball, golf makes the batter do his own fielding—another topsy-turvy arrangement.

Any self-respecting sport makes quantity the basis of scoring. Not so this cynical game of the Scots—the idea of the lowest score winning could only have been thought out by a thrifty soul.

That the electrical industry as a class, and business as a whole, should have absorbed golf like it would absorb so much Scotch of a moist nature—straight—isn't surprising. Golf provided in one dose, painless to take, exercise, relaxation and just the right touch of bizarre to give it zest, yet remained gentlemanly, formal, and somewhat intricate. Engineers, business men, executives and organizers, habitually tied to organization, class and economy and yet desiring and needing relaxation, could not have found a more glorious game.

Golf took the busy man from the melee of busi-

ness, out into a green pasture with nothing more to do or think on than a white pill—putted externally rather than internally. The chap who would die of loneliness on a solitary walk with no excuse for walking, is given a definite goal to reach,—18 in fact,

The inventor of golf, "A'll mek me a game nerra a one like it in the wurrld."

each an achievement in itself. At one stroke it gives him bodily exercise, relaxation and goodfellowship, and still a chance to practice efficiency, skill, executive planning and higher accounting. The mind of a man trained to keep down costs naturally ran to a game that keeps down scores.

At the same time, golf allows a man the opportunity to wear those exceedingly sporty togs—breeches and woolen stockings, ribald sweaters and jackets, and all that gorgeous paraphernalia that a man would hardly dare wear without perfectly golfish provocation.

Is it any wonder that the chief byproduct of conventions is this great game? Delegates spend hours preparing and studying for committee reports, deep and intricate mathematical subjects. They flock to the conventions—meet bosom friends—and Lord bless 'em, the reports seem trivial beside that powerful urge to romp and play. Golf is as natural to conventions as teeth to babies and far less disturbing. The real pity is that much of the golf has to be bootlegged when committee sessions are supposed to be in progress—although this doubtless adds savor to the sport.

Inasmuch as no human being can go year in and year out, working watts and megohms and power factors, worrying over socialists and water and power acts, planning extensions and the means to give a million more people all the juice they want and then teach them to want more, building tunnels to tap mountain reservoirs that they also have built, designing steam units to go to bat when Jup Pluvius fails to do his stuff and leaves the mountains as dry as the populace—can anyone with a heart criticize the delegate for leaning toward golf?

As in the case of conventions, I felt strongly that something ought to be done to introduce golf to those few conscientious objectors who yet remain uninoculated. Only by making addicts of them can they be brought to realize what they miss.

—allows a man the opportunity to wear those exceedingly sporty togs.

And perhaps moisture, which will permeate the next of these articles, as it often does conventions, may have the same things said in its behalf by one who neither golfs nor imbibes—and convenes only rarely.

The Indeterminate Permit

By John A. Laing*

Vice-President and General Attorney,
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THE problem of franchises is one of the most important confronting the utilities today. Franchises are not granted as favors to people in business but as a means for securing for the public a necessary and convenient service. Despite this, there are no uniform policies governing their issuance. Instead there is confusion of ideas and methods. In this article Mr. Laing points out the necessity for proper legislation regulating the issuance of licenses to use public property for the benefit of the public itself.

THIS discussion bears a somewhat colorless and unprepossessing title. One might wish for a phrase or expression better calculated to arouse interest in a question of such prime importance. If much that is said may appear to go beyond the specific subject assigned, it will be because the subject goes to the fundamentals of the relations between the public and its utilities, and demands the consideration and clear understanding of these relations.

The license to occupy the streets and highways with poles, mains and other utility fixtures is commonly termed a franchise. In essence, it is merely a permission to use public property for a recognized public purpose. It is granted, not as a favor to the persons engaged in the business, but as the means of securing to the public a convenient and necessary service. It is founded squarely and solely upon the right of the public to have its property employed to its advantage.

Reference to this elementary principle and its necessary implications will indicate the considerations which should prevail in the granting of such licenses, as well as the nature and purpose of the conditions properly imposed upon their exercise. The license should be granted only in furtherance of a recognized public interest and convenience; its conditions should be only such as will promote that interest, without precluding or unduly restricting other necessary public uses of which the highway may be susceptible.

State policy as embodied in its statutes determines what uses of the highway may be permitted as serving the public interest. The granting of the license, and the fixing of its terms and conditions, are commonly delegated by statute to administrative boards or local municipal authorities, usually without any clearly defined principles or criteria for their guidance. Instead of a uniform state policy, broadly based upon the principle that service to the public is the justification and the object of the license, we frequently find each local unit, by charter and legislative restrictions, and by negotiation sometimes with the aid of a vigorous club, dictating its own policies and imposing its own conditions for permitting the supplying of public service within its limits.

The natural result of such practices has been great confusion of methods and ideas, and the general obscuring of the real interests of the public in these so-called franchise matters. For this condition, our predecessors in the utility field are perhaps as much responsible as anyone else. Attempts to regulate the operations of these utilities were frequently met with claims of contract rights based upon stipulations or conditions contained in their franchises. While such claims rarely availed to prevent just regulation, the mere fact that such claims were advanced stimulated granting authorities to harder bargaining with subsequent licensees, and to greater emphasis upon time limitations as a means of assuring the periodic readjustment of the bargain.

This development is not to be wondered at in the circumstances, even though experience has shown it to have been both unnecessary and unsatisfactory as a method of equitable regulation. It has taken many years of legislative and judicial activity to enunciate the broad scope of governmental powers over such matters, and to demonstrate the ability of the state to deal with these problems effectively and equitably, without recourse or regard to contract or franchise stipulations.

Unfortunately, however, the controversy and the prejudice engendered in course of this development have survived the conditions that occasioned them, and a great deal of this prejudice still persists in the general attitude toward franchise questions. As spokesmen for an industry whose earlier representatives have contributed their full share to the present confusion and muddlemindedness, it is our duty to aid in clarifying public understanding of these questions, and if possible to point the way to their satisfactory solution. This discussion of the so-called indeterminate franchise or permit is undertaken with that duty and that purpose uppermost in mind.

In taking stock of progress made in dealing with utility problems, we find certain important principles now firmly established and receiving general recognition. One of these has already been referred to, namely, that the basis of all utility franchises in the highway is the right of the public to have its prop-

*From an address presented at Seventeenth Annual Convention, Northwest Electric Light and Power Association, Gearhart, Ore., June 25, 1924.

erty devoted to its own use and service. No adequate consideration of the problem is possible which does not keep this premise clearly in the foreground.

Moreover, whatever agency may be intrusted to perform this public service, whether governmental unit or regulated private industry, its use of the highway is, and should always remain, subject to public regulation and control in the interests of safety, and of co-ordination with other present and future uses of the highway for the public convenience.

Another aspect of this governmental power is of controlling importance. Reduced to its simplest terms, the primary interest of the public in its utilities is to secure adequate service at reasonable rates. The power of the state to safeguard this interest, by appropriate regulation of all such enterprises, is plenary; its ample capacity and effectiveness for the purpose are no longer open to doubt.

Nor does this power rest or depend in any degree upon contract, upon franchise stipulation or condition, or upon the right to control the use of public property. Its essence is governmental, rather than proprietary or contractual; it inures to the state at all times as an attribute of sovereignty. It should not, and in most jurisdictions cannot, be abdicated or bargained away even for limited periods of time.

With this power preserved in full vigor, detailed franchise terms or conditions concerning the rates, quality or other elements of utility service are neither necessary nor helpful to its effective exercise or the accomplishment of its purpose. On the contrary, such terms, and their emphatic assertion by one party or the other as unchangeable contract rights, have frequently confused and prejudiced the timely exercise of this power in the public interest.

Another important public power is relevant to this discussion. The public, through its various governmental agencies, at all times has the right, upon payment to its owner of just compensation for the taking, as determined by its own tribunals in the manner provided by law, to appropriate and take over the properties and business of any public utility enterprise. This right similarly exists independently of, and is superior to, franchise provisions. Moreover, upon its exercise, as in the fixing of reasonable rates, no value or compensation may be recognized or allowed for any franchise, license or permit under which the property to be taken is being maintained. The public pays only for the private property it takes over; the rights in the highway, previously trusteed to the utility for a public purpose, automatically revest in their owner without cost or added expense, as a necessary incident of the transaction.

With these rights and interests of the public frankly recognized, what of the interests and rights of the investor in a public utility? His savings are invested in the public service in expectation of the limited, but reasonable, reward which the law contemplates he shall receive under prudent and efficient management. His right to this reward is not a creature of contract, but rests upon the principle that no man's property or its use may be taken for public purposes without just compensation. His interest and his concern are in the securing of this compensation and the preservation of his principal. His problem is to attain these ends in harmony with the rights and interests of the public. The necessity of harmonizing these interests is obvious if both are to prosper.

We have proceeded far enough to realize that the ideal franchise or license to use the highway is one that will not impair the public right to uninterrupted control of its property in the interests of public safety and of co-ordination with other necessary uses; that will not prejudice the public right to regulate reasonably the operations of those employed in its service; that will promote the interest of the public in securing adequate service on reasonable terms; and that will encourage rather than unnecessarily obstruct the employment of individual savings and individual initiative in supplying these services to the public. With the knowledge and experience obtained from the last half century of discussion and contact with these questions, this ideal should not be difficult to attain.

We must first discard the theory of contract as of controlling importance to the franchise relation, beyond the necessary assurances to the licensee against loss or practical confiscation of his property so long as he continues faithfully to perform the required service in conformity with all reasonable public demands. No other contractual element is necessary or likely to promote the mutual interests of the parties.

Just as the legal institution of marriage, while partaking of certain elements of contract, creates a new status for the parties with certain well-defined rights and obligations, both as concern themselves and the general public, so he who voluntarily assumes the function of a public utility becomes impressed with well-defined obligations and responsibilities in respect of that service. These obligations do not exist by virtue of his use of public property in aid of the service, or of any contract or condition relating to such use. They would be equally applicable and effective were it possible to conduct the service without use of any public property. They arise by operation of law as part of the new status assumed, and are inherent in the undertaking. As such they should be left to the law to define in the light of sound public policy applied to the ever-changing needs and conditions of society. Attempts to define them by contract or franchise obscure the true character of the relationship, and have proved futile and impracticable as instruments of effective control.

The indeterminate franchise or permit, as this form of license has been designated in the states where we find it in operation, is predicated squarely upon the recognition of this status, and the responsibilities and obligations which it creates.

It says in effect that the licensee, whose operations are permitted to serve the public interest and convenience, shall have the right to use the public highways for this purpose, subject to present and future regulation and co-ordination of that use, and subject to public regulation and control of all of his

utility operations, for so long as he performs his duties in the manner contemplated and defined by law, as from time to time declared, or until his property shall be taken over by governmental authority upon the payment of just compensation.

It substitutes for the clumsy, unnecessary and now anachronistic term "franchise," with its incubus of detailed covenant and condition, a simple straightforward license to serve the public in the manner required by law, and an assurance against the confiscation of the licensee's property during his good behavior. It reserves to the public, without the necessity or risk of enumeration, every right necessary for the present and future protection of its interests. Only confusion and misunderstanding attributable to prior misplaced emphasis on contract rights can explain its tardy recognition, or the delay in its universal adoption.

Possibly the rank and file of the community, absorbed in their own immediate affairs, possibly many of those engaged in this very enterprise, have failed to grasp the significance and effect of the fixed time limitations in the ordinary utility franchises to which we are accustomed. This time limitation, be it long or short, means the definite expiration of the right to continue in business at the time fixed. As it contains and implies no right of renewal, as the courts have consistently declared, the licensee eventually becomes a trespasser upon the highway, and his property under such conditions becomes a public nuisance. After its expiration he may continue, if at all, only at the mercy and the whim of existing authority, and his property, no matter how valuable for its purposes or how efficiently maintained, is practically valueless if salvaged or removed.

The necessary and logical consequence of such a condition would be the amortization of the capital investment during the life of the license, by requiring the users of the service to pay such amounts in addition to the expenses of operation, upkeep and interest as will pay back the principal during this period. Surely no valid complaint could be made of the justice or necessity of such action, if the time limitation is to be accepted at its face value; and disaster may readily occur if this course is not followed. In certain instances of notable importance this has actually occurred, and valuable properties have been subjected to practical confiscation upon the expiration of their limited franchises.

Actually, of course, such amortization of the investment is neither practicable nor desirable. It would add an unbearable load upon the cost of the service in the majority of cases, and in any case would paralyze and prohibit the effective maintenance of the property and the service. The manifold items of utility property have varying useful lives and must be repaired and replaced from time to time to maintain the service. An electric system, gradually developing and enlarging to serve the growing public need, does not go along like the "one hoss shay," effective in all of its parts and as an assembled unit, to a point of complete collapse at some definite future date. The very nature of the service requires the constant maintenance, replacement and development of the various units and of the system as a whole, a condition wholly inconsistent with the idea of paying back the investment during the arbitrary term of the license.

The situation reminds one of the old problem in logic, of "what happens when an irresistible force meets an immovable object." The investment must be amortized; in practice this can't be done. In consequence we don't try to do the impossible, but, nevertheless, serious consequences result to the public and to the enterprise from being placed in this impossible and wholly unnecessary predicament. It takes large sums of money, year by year, to develop the modern utility in pace with the public demand. This money has to be obtained by the sale of bonds and stock to persons familiar with the risks and the problems of the business, and the cost of this money will necessarily reflect the risks to be encountered.

No reputable bond house will offer its clients the securities of a utility, no matter how sound and attractive in other respects, if a substantial part of the investment is under a franchise expiring during, or shortly after, the maturity of the bonds. Those who invest under such conditions are asked to gamble on the renewal of the franchise on reasonable terms, and they naturally demand recognition of this risk in the terms upon which they part with their money. In many cases, adequate financing is impossible when most needed, and the public suffers a double detriment in the loss or impairment of service and in the burden of supporting the cost of an unnecessary risk.

All of this artificial handicap, which benefits no interest and serves no useful purpose, is eliminated by the indeterminate franchise. The adoption of the latter, or its essential features, by all communities intelligently alert to their own self-interest, is bound to come as the present intolerable situation becomes generally appreciated. No complicated legislation is necessary to provide this reform or to secure its benefits. While Wisconsin, Indiana, and a number of other states have adopted rather lengthy and elaborate provisions for this purpose, the essential principle is simple enough and may be put into practice by correspondingly simple enactment.

A legislative declaration in substance that all permits or licenses for use of the streets and highways for utility purposes shall continue during good behavior or until the property erected thereunder is acquired by the public in the manner provided by law, would accomplish the purpose and be readily understood. The expression of this declaration in scientific, legal phraseology may require careful draftsmanship to insure accuracy and conformity with local law, but presents no serious difficulty. The only serious problem is one of education; of clarifying and developing our own and the general understanding of basic principles to the point where present confusion and prejudice will disappear, and the way be cleared for the recognition of these principles in appropriate legislation. The full discussion and comprehension of the so-called indeterminate franchise will mark a long step forward toward the attainment of this ideal.

When Government Goes Into Business

SINCE this is to be a sermon, it is both fitting and proper to begin with a text. Consider, then, the Water and Power initiative measure to be voted upon by the electorate of the State of California in November next, by which, through a constitutional amendment, bonds are to be issued in the amount of $500,000,000 for the purpose of setting up an unrestricted, unregulated state monopoly of electric power.

Section 3 paragraph (b) authorizes the Board (the California Water and Power Board consisting of five members) "To purchase, acquire, produce, manufacture or otherwise provide facilities, materials and supplies, raw or finished, and any property or thing necessary or convenient to the accomplishment of the purposes of this article."

TO help business by putting business out of business is one of the bits of logic offered by the proponents of such socialistic measures as the California Water and Power Act. This measure gives to the board it creates unlimited and unheard of powers. What happens when communism is given an opportunity is shown by a survey of the Turlock and Modesto Irrigation districts, where stores have been opened and a general supply business is being carried on to the detriment of private concerns engaged in similar activities.

State May Enter Any Field of Business

It is difficult to conceive of anything broader, or of wider scope than this innocent appearing clause. It requires no great stretch of the imagination to see visions of manufacturing establishments for the production of anything from pole-line hardware to Portland cement. The manufacture within the immediate future, of hydraulic prime movers or electric generators would seem hardly practical, and perhaps the manufacture of Portland cement might seem equally beside the point, nevertheless it should not be forgotten that the City of Los Angeles installed its own cement plant at Monolith during the construction period of the Los Angeles aqueduct.

It would seem almost a foregone conclusion, however, that should this measure pass, as little patronage of private business as possible would follow as a matter of course; in fact, as has been shown in a number of similar situations, permanent state competition with private business in the electrical and general supply fields is not merely possible but highly probable. There is nothing to prevent the Board, if it should feel inclined to build up a larger number of state employees, to employ at day's wages, men to handle house, factory and office building wiring, to open and establish electrical jobbing and retailing establishments to deal with general hardware and building materials, in short to socialize as nearly completely as practical, any industry within the State of California and put existing establishments out of business, leaving to all other industry the responsibility for making up the deficit in the tax rolls that such a procedure would entail.

It is all very well to say, "Of course it wouldn't do anything of the sort." The fact remains that under this Act, it (the Board) could do so, legally, if it felt so inclined, and it would seem to be the height of folly to go away at night and leave the safe door unlocked because of a child-like belief in mankind, especially since, in this particular case, even the policeman on the beat would be empowered to help carry off the loot.

To help business, by putting business out of business, is a curious bit of logic, yet this is in effect, one of the claims made by the sponsors of the Los Angeles Bureau of Power and Light, in speaking of the alleged benefits derived by everything from retail stores to factories through the acquisition by the city of the privilege of producing and distributing electrical energy in that city.

Experiences in Modesto-Turlock District

As an example of how this idea works in actual practice, consider the Turlock-Modesto irrigation project. This, of course, is not a state enterprise, but a local scheme which, nevertheless, closely parallels the idea conveyed above, and gives a fair example of what one may reasonably expect, in the course of time, if the Water and Power Act should by any unhappy chance pass this fall.

Originally devised as an irrigation project, the two districts, Modesto and Turlock, voted an aggregate amount of $6,000,000 in 1920 for constructing the Don Pedro dam, for the purpose of storing water for use during the summer months. A. J. Wiley, an engineer in the employ of the U. S. Reclamation Service, recommended as a conservation measure the installation of three 5,000-kva. units through which power could be generated as a byproduct of the primary purpose of the water, and that the power thus produced be wholesaled to the private power companies whose distribution lines were adequate to deliver this additional electrical energy to the consumers in the two districts.

Shortly before the bond issue came before the public, the board of directors, which at the time was favorable to wholesaling the power, agreed that before any arrangement could be made for disposal of the power the project should be submitted to a vote of the people, allowing them to state whether or not the power should be wholesaled to a public utility company or whether it should be retailed by the districts themselves.

Private Company Offers to Buy Energy

The dam and power house were erected, and in the latter part of 1922 it became necessary to decide how the electrical energy should be disposed of. The Pacific Gas & Electric Company made an offer to purchase the power from the two districts, paying four mills per kw-hr. for such electricity as irrigationists should supply from the power house. The company agreed to take the power as it should come from the power house, placing no restrictions upon maximum or minimum amount. The Pacific Gas and Electric Company had a line extending to the Don Pedro power house, and the proposal provided that the company should take power from the districts at the power house; thus no additional expense to the district for transmission or distribution lines would be necessary.

Under a separate agreement which had been signed previous to the erection of the Don Pedro dam, the Pacific Gas and Electric Company was to get 10,000,000 kw-hr. per year from the power generated at the Don Pedro power house in return for certain water rights that the Pacific Gas and Electric Company deeded over to the two irrigation districts. This power was to be delivered to the company at the power house without cost.

At the election held the latter part of 1922, the people voted that the power should be retailed direct by the districts contrary to a recommendation presented by Louis F. Leurey, electrical engineer who had been secured to make a recommendation concerning what should be done with the Don Pedro power. The offer of the Pacific Gas and Electric Company was rejected and it was necessary that additional money be raised for the purpose of erecting transmission and distribution lines to serve the two irrigation districts. Each district voted $1,000,000 for this purpose and a joint transmission line was erected. The cost of this line was pro-rated according to the amount of power that each district was entitled to receive.

Districts Enter Manufacturing and Retail Field

At the time that the districts decided to go into the retailing of power, R. W. Shoemaker, electrical engineer of the Turlock Irrigation District, proposed to utilize the power that would be generated at night by building a fertilizer plant near the Don Pedro power house, and it was his contention that fertilizer could be manufactured there at a cost of $8 a ton. It was his plan to operate the fertilizer plant from eight to ten hours a day, using the power only when demands of the districts did not reach the capacity of the Don Pedro power house. However, nothing was done to carry out the plan, and the matter was dropped.

The transmission line and two sets of distribution lines were erected by the districts, and the Turlock Irrigation District started serving consumers about June 1, 1923. The Modesto district started serving its consumers about Oct. 1, 1923.

Shortly after the districts went into the distribution of power, the Turlock Irrigation District opened a retail electrical store to sell electrical appliances to residents in the district at about 20 per cent above the district's own cost. The Modesto district did not open a store until about March, 1924.

Both districts have been active in their efforts to secure a large number of consumers, both in the towns of Modesto and Turlock and in the outlying sections where distribution lines have been installed. Solicitors have been employed to assist in securing business, and to facilitate their efforts, forms have been prepared that are used to advise the private company that the consumer desires to discontinue its service. The Modesto Irrigation District uses printed postcards. advising the private company to remove the meter immediately as the consumer has accepted service from them. In some cases, the company finds that employees of the district have removed the meter and that it is lying on the ground. All that is necessary for the consumer to change service to the Modesto or Turlock Irrigation District lines, is to sign either the postcard furnished him by the Modesto district or the mimeographed letter furnished by the Turlock district. The Turlock letter advises the company "to remove your meter as soon as, but not before, you are notified that they have made connection to my premises." The Turlock district also secures from a prospective consumer his signature on a contract specifying that the consumer will accept service only from the Turlock Irrigation District as long as the contract is in force. As a general rule these contracts are made out for a period of two years.

Does This Constitute a "Blacklist"?

In their efforts to secure business in Modesto, the irrigation district men have prepared a list of "approved" merchants. This list of merchants includes only those who are taking service from the Modesto Irrigation District. They are given a card to place in their windows carrying the information that they are "helping to reduce taxes" by using Don Pedro electric power. Many of the merchants, even though they are supporting the district, object to being forced into the purchase of district power by this method.

The retail store conducted by the Modesto Irrigation District has been open for business since about the first of March. At present the material that is being handled in the store consists principally of ranges, water heaters and air heaters. The ranges occupy the principal position. In addition, there is carried quite a comprehensive stock of wiring material. In fact, all the material that is necessary to wire a house is handled by the district office. All of the devices and appliances that are handled by the district are sold at about 20 per cent above net cost to the district. It is the theory that this 20 per cent added to the cost of the goods will carry overhead expenses. No check has been made as yet and it is not known what the running expenses of the store will be. There is one man employed, the store occupying a space approximately 50 by 100 ft. Ranges line both sides of the walls and towards the rear of the store there is a small stock of water heaters.

It is the policy of the store to sell this material in order that the district's load may be greatly increased by getting the current-consuming devices on the lines. It has not been decided yet whether or not the district will go into the merchandising of the smaller appliances, but, if the farmers demand it the districts will probably comply in the near future.

Although the farmer is not advised to make his own installation, in many cases this work is being done either by the home owner himself or by the home owner under the guidance of some farmer who has a smattering of knowledge of electrical wiring. In many cases there are high school students and others who have received minor education in this work and they are directing the farmers as to methods of wiring their own homes.

Dealers Find Conditions Discouraging

The district office does not recommend the name of any electrical contracting firm in Modesto, but supplies a list of private firms from which the farmer or city consumer may select any one he chooses and get that concern to do the wiring for him.

It is not known how many ranges have been sold but it is probable that the number is around half a carload for the period that the store has been open. It is stated that seven carloads of ranges have been sold in the Turlock store since June, 1923.

Established dealers deplore the condition as it is in Modesto at the present time, and state that it is most discouraging to find the district coming in and taking business from private concerns which have been serving the public for years. Under present conditions where farmers and amateurs are doing their own work, the quality and efficiency of installations have fallen off greatly.

Established concerns are getting practically no new business in the contracting field as a result of new homes being put on the lines of the Modesto Irrigation District and it is difficult to ascertain who is really doing the wiring business, unless it might be the curbstoners and the home owners themselves. It is stated that contractors can buy wiring supplies from the district office at the regular price they charge to the public. These prices are often less than the wholesale jobber's prices in San Francisco for the same material.

Effect on Other Businesses

It should not be assumed that the socialization, or communization perhaps, of the Turlock-Modesto district is confined to district competition with private business in the electrical industry alone. On the contrary it is gradually extending more and more into other fields, principally general supplies, building supplies and hardware. It has been stated that the district sells Portland cement, for instance, and lumber at prices ranging from 10 to 25 per cent less than any retail merchant can possibly make and live. Even the automobile accessory man is suffering, one accessory shopkeeper stating that his tire business has dropped to about one-third its former volume through the competition of the district store which is selling tires and automobile supplies. Over all merchants engaged in private business in this district there is the ever-present fear of the boycott by those interested in the district itself. Many of these merchants own their homes and have money invested in their business. They could not move elsewhere without sacrificing the property they have accumulated since they settled in the district.

Example of Socialistic Community

What becomes of the losses that must accrue in the operation of the various retail store enterprises under the jurisdiction of the district is not known, but it is of course more than likely that they are absorbed in the general affairs of the district as a whole as is customary in enterprises of this character.

While it is not claimed that the Turlock-Modesto enterprise is a state-owned and operated institution, nevertheless, it represents in a local sense, what might be expected under the operation of the proposed California Water and Power Act. It is a fair example of a socialistic community, even communistic enterprise, and what will happen to private business, should the State of California be converted into one great Turlock-Modesto district, in which conceivably every business activity might be a community affair.

While the farmers owning the land which has been heavily bonded for the purpose of financing their enterprise, must nevertheless pay state, county and federal taxes, as do all other private citizens, as well as charge their enterprise with the sums required for amortization and interest on their bonds, the competition that might be set up by the state under the proposed Water and Power Act would be infinitely worse. The state ownership and control scheme would have to pay no taxes and would require only provision for amortization and interest payments of bonds, and even this may be camouflaged through the easy access to the proceeds of general taxation, as provided by the Act (Sec. 7 providing that bonds may be sold for the purpose of meeting principal or interest payments) and (Sec. 9 that if moneys in the state treasury shall be insufficient for the payment of principal or interest of bonds, moneys shall temporarily be advanced from the general fund for that purpose).

Study of Socialistic Community

To see into the future, one must study history. There is the history of the South Dakota fiasco, the government operation of railroads during the war, the fact that Detroit, Seattle and Los Angeles have the highest tax rates, respectively, of any cities in the United States, and that all three are given over to the extensive operation of municipally owned and controlled utilities, and then there is the local experiment in communism represented by the Turlock-Modesto Irrigation District, beginning as a simple organization of landowners anxious to improve their crops by the development of water for irrigation purposes, and then, as the virus spread, engaging successively in the power business, and the retailing of electrical appliances and supplies.

To learn what one must expect in the future, one must study the past.

California's Tie-in with the Better Home Lighting Campaign

At a meeting of the California State Cooperative Campaign that took place in San Francisco Friday, Aug. 29, plans were formulated for the participation of the Twelfth District in the Better Home Lighting Campaign. R. E. Fisher, regional director for the Twelfth District, presided at the meeting. The Twelfth District includes the states of California, Nevada and Arizona.

Generally speaking, the underlying motive of the entire campaign is to promote better, that is, more intelligent lighting of homes. It is stated to be a fact that 25 per cent of the school children of this country have defective vision and when minor defects are added the total becomes nearly 75 per cent. Engineers in developing high intensity illuminating apparatus have realized that the advantage of the high intensity would be entirely lost if it were not intelligently applied. Their methods of attack for disseminating knowledge on this subject have not proved wholly satisfactory, so a committee of national leaders of the electrical industry was appointed, a fund raised and a plan devised whereby the story of better lighting could be carried into the homes of the American people. It was believed by the committee that if the school children could be interested in the fundamentals of proper home lighting an interest in this subject could be created whereby a great change could be brought about in existing methods and thus conserve the eyesight of this as well as succeeding generations.

In brief, the plan provides for setting up a series of prizes for the best essays on better home lighting. By competition for these prizes the interest of the school children will be aroused; they will be thus encouraged to study the subject and they will undoubtedly see in their own and their neighbors' homes glaring examples of bad lighting, and at the same time will inform themselves as to the best ways and means of correcting them.

Nationally speaking, the greater part of the fund raised will be expended in a national advertising campaign which will carry the message of what the campaign is about and what it expects to accomplish into the homes of the great intelligent American public. Then there are state campaigns which tie in with the national campaign, follow up the impression created and in reality constitute the field forces for the purpose of carrying the message of better home lighting to everybody.

The plan devised by Mr. Fisher and his committee provides for the division of the State of California into twenty-one districts, each district in charge of a local committee. It is proposed to effect a contact with the schools through the school department and the teachers. All school children ranging in age from ten on up through the high schools are eligible to participate in the essay contest. Application blanks are to be distributed to each pupil eligible. Upon receipt of the application blank by each local committee a lighting primer, which is really a textbook on the fundamentals of lighting, clearly and simply written, is sent to each contestant. The primer also embodies typical plans of the rooms ordinarily found in the average home together with a series of sketches of the various lighting fixtures, which the contestant can cut out and paste in the blank plans carried in the back of the book to show how he or she would light the home. The essays, which are limited to six hundred words, will tell the reasons why. Each contestant is required to set forth how he or she would light his own home and make the same comments and criticisms on the lighting of two neighbors' homes.

The international prizes include the following:

First Prize—
$15,000 model electrical home (to be built on lot provided by winner).

Two Second Prizes—for one boy, one girl—
$1,200 scholarship in American or Canadian College or University of accepted standard.

Two Third Prizes—for one boy, one girl—
$600 scholarship in American or Canadian College or University of accepted standard.

Two Fourth Prizes—for one boy, one girl—
$600 scholarship in American or Canadian College or University of accepted standard.

Two Fifth Prizes—for one boy, one girl—
$300 scholarship in American or Canadian College or University of accepted standard.

Two Sixth Prizes—for one boy, one girl—
$300 scholarship in American or Canadian College or University of accepted standard.

In addition to these, there will be state prizes in California and also district prizes in each district.

Since Mr. Fisher was appointed regional director it was deemed advisable that the organization of the California Electrical Cooperative Campaign should be employed to excellent advantage in handling all details for the reason that it was already set up to do this class of work and had adequate facilities available to proceed at once.

A fund of $15,000 is to be raised within the electrical industry to carry on the expense of the state campaign, provide prizes, etc. Two state committees have been appointed—the Finance, of which R. M. Alvord is chairman; the Advertising and Publicity, of which C. T. Hutchinson is chairman; and a Judging Committee which will determine the relative merits of the many essays that will be submitted. It is proposed that the latter committee shall include three prominent educators, three lighting engineers and one member of the Cooperative Campaign who will act as chairman. Each local committee will assume among its other activities the function of judges with respect to the local essays so that only the prize win-

ners locally will come before the state committee. Of these the state committee will select the most meritorious and forward them to the national committee for consideration in the awarding of the national prizes. The function of the state Advertising and Publicity Committee is to provide advertising copy and publicity matter for dissemination through power company publications, teachers' journals, health and optical bulletins and to arrange for the broadcasting of radio messages.

In the organization of districts within the state it has been attempted as nearly as possible to center those local organizations at points where there is an electric club so that the activities in those districts may become a function of that organization. Remaining districts have been divided up according to power company territorial divisions and the activities therein will be conducted with the cooperation of the power company and its district officials. It will be the duty of each district chairman so to organize his territory that the fullest information possible concerning the contest may be disseminated as broadly as possible throughout the electrical industry. Each district committee will have its own advertising committee, publicity committee and judging committee. The advertising committee will secure the cooperation of dealers by which their shop windows may be utilized to tie in with this effort. The jobber's salesmen in each district may also do a useful work in telling the story. Wherever possible it is advisable that each district shall have a school relations committee which will work through the schools in securing the broadest dissemination of literature possible.

The California Electrical Cooperative Campaign through its general offices in the Rialto Building, San Francisco, will secure and distribute registration cards and primers and all other printed matter through the district chairmen upon demand. The primers will be allocated to districts according to population as disclosed by the last census and will be supplied only upon receipt by the campaign of contestant's registration cards properly filled out. With the proper effort registration cards will be passed around and returned properly filled in to the offices of the Cooperative Campaign not later than Oct. 10.

There will be five prizes provided for each district in the state, as follows: $75, $50, $25, $10 and $5. In addition there will be six state prizes: $500, $250, $100, $75, $50 and $25. It should be pointed out most emphatically that this campaign is an educational movement pure and simple. It is absolutely non-commercial and the interjection of any commercialism into the campaign will not be permitted. It is a constructive move for the achievement of a hygienic purpose. This in itself, if it can be accomplished, will more than justify the outlay of time and money on the part of the electrical industry.

ARRANGEMENT OF DISTRICTS

Dist. No.	Embracing	League	District Chairman	Address
1	Del Norte Co. Humboldt Co. Trinity Co.	None	Geo. McDonald	Western States G. & E. Co., Eureka, Calif.
2	Shasta Co. Lassen Co. Tehama Co. Glenn Co. Plumas Co. Butte Co. north of and including Chico.	Northern Cos. Elec. Dev. League	L. R. White	P. G. & E. Co., Chico, Calif.
3	Butte Co. south of Chico Colusa Co. Sutter Co. Yuba Co. Sierra Co.	Yuba-Sutter Elec. Dev. League	F. A. Peck	P. G. & E. Co., Marysville, Calif.
4	Nevada Co. Placer Co. El Dorado Co.	None	H. S. Furlong	P. G. & E. Co., Auburn, Calif.
5	Sacramento Co. Solano Co. Yolo Co.	Sacramento Valley Elec. Society	Roy Phelan	910 Ninth St., Sacramento, Calif.
6	Mendocino Co. Lake Co. Napa Co. Sonoma Co. Marin Co.	Marin County Elec. Dev. League	J. S. Ross	P. G. & E. Co., San Rafael, Calif.
7	San Francisco County	S. F. Elec. Dev. League	H. H. Allison	Elec. Appli. Co., San Francisco, Calif.
8	Contra Costa Co. Alameda Co.	Oakland Elec. Club	Clark Baker	562 11th St., Oakland, Calif.
9	San Mateo Co. Santa Clara Co. north of Gilroy	Santa Clara Valley Elec. Dev. League	R. R. Robinson	P. G. & E. Co., San Jose, Calif.
10	Santa Cruz Co. San Benito Co. Monterey Co. Santa Clara Co. south of and incl. Gilroy	Monterey Bay Elec. League	J. F. Pollard	Coast Valleys G. & E. Co. Salinas, Calif.
11	San Joaquin Co.	None	H. K. Griffin	Western States G. & E. Co., Stockton, Calif.
12	Amador Co. Alpine Co. Calaveras Co. Tuolumne Co. Stanislaus Co.	None	L. J. Nevraumont	P. G. & E. Co., Modesto, Calif.
13	Merced Co. Mariposa Co. Madera Co.	None	A. M. Frost	San Joaquin L. & P. Corp., Madera, Calif.
14	Fresno Co. Tulare Co. north of and including Dinuba	None	A. M. Frost	San Joaquin L. & P. Corp. Madera, Calif.
15	San Luis Obispo Co. Santa Barbara Co. north of and including Santa Ynez	None	A. M. Frost	San Joaquin L. & P. Corp., Madera, Calif.

ARRANGEMENTS OF DISTRICTS—Concluded.

Dist. No.	Embracing	League	District Chairman	Address
16	Kern Co. Kings Co.	None	A. M. Frost	San Joaquin L. & P. Corp., Madera, Calif.
17	Tulare Co. south of Dinuba	None	R. R. Carruthers	So. Cal. Ed. Co., Visalia, Calif.
18	Los Angeles City	Los Angeles Elec. Club	K. E. Van Kuran	Westinghouse Elec. Co., Los Angeles, Calif.
19	San Diego	San Diego Elec. Club	A. E. Holloway	San Diego Cons. G. & E. Co.
20	Los Angeles Co. Orange Co.	None	A. W. Childs	So. Cal. Ed. Co. Los Angeles, Calif.
21	Ventura Co. Santa Barbara Co. south of Santa Ynez	None	A. W. Childs	So. Cal. Ed. Co., Los Angeles, Calif.
22	Mono Co. Inyo Co. San Bernardino Co.	None	George Bigelow	So. Sierras Pwr. Co., Riverside, Calif.
23	Riverside Co. Imperial Co.	None	George Bigelow	So. Sierras Pwr. Co., Riverside, Calif.
24	Nevada	None	Geo. A. Campbell	Reno, Nevada
25	Arizona			

The COAST Outlet
ELECTRICAL CONSTRUCTIONISTS' and DEALERS' NEWS

A Practical System of Accounting for Contractor and Dealer

By F. V. Mitchell

IN the Aug. 15 issue of the Journal of Electricity an illustration of the summary of total costs and selling prices of jobs finished during a month was presented, from which the monthly gross and net profits of departments Nos. 1 and 2 can be ascertained as shown in Table I.

As will be noted from the above example, the gross profit is ascertained by deducting the material

Summary Of Wiring Job F

Job No	Name	Location	Selling Price	%	Labor	%	Material	%	Pr
476			××500	100	1×000	×3	×47×0	47	
477	Various		36×00	100	7×00	×1	16××0	44	
478			4×000	100	10000	××⅓	×0000	44½	
479			×7×00	100	××00	×0	11000	40	
480			×7×00	100	13000	×3	27××0	47	
481			46000	100	10×00	×3	×1700	47	
48×			44000	100	8×00	19	18100	41	
483			4××00	100	××00	13	19900	47	
484			××7×0	100	10000	15	300×0	××	
493			367×0	100	8900	×4	1×600	4×½	
Totals			444000	100	91400	×0½	×0460	46	

Fig. 1.

and labor costs from the sales, and the net profit by deducting the overhead expense from the gross profit. All percentages of costs, overhead and profits are figured on the amount of sales as 100 per cent, and deductions made therefrom in the same manner. The percentage of overhead expense to the sales should always equal the difference between the percentages of gross and net profits, and it is necessary to show this merely to prove the correctness of the percentages of gross and net profits. The percentage of overhead to sales should not be confused with the percentage of overhead to costs, the latter being considerably higher and the proper one to use as an addition to estimated material and labor costs for contract bid purposes to cover overhead sufficiently. For instance in the above example, the percentage of overhead to material and labor costs in department No. 1 is 35 per cent as against 23-1/3 per cent to the sales, and in department No. 2 is 75 per cent as compared with 39 per cent to the sales. The percentage of overhead to costs is ascertained by dividing the total overhead expense by the total amount of material and labor costs, and is therefore necessarily the proper percentage to add to material and labor costs to take care of overhead.

TABLE I

	1		Per Cent		2		Per Cent	
Sales	$4,440.00		100		$1,900.00		100	
Cost of Goods Sold—								
Material	$2,046.00		46		$653.00		34	
Labor	914.00	2,960.00	20-2/3	66-2/3	325.00	978.00	17	51
Gross Profit		$1,480.00		33-1/3		$922.00		49
Overhead Expense		1,036.00		23-1/3		733.50		39
Net Profit		$ 444.00		10		$188.50		10

Figs. 1 and 2* contain an illustration of the summaries of wiring and fixture jobs, respectively, finished during the month, which are prepared from the detailed job cost sheets at the end of each month

*Fig. 2 will appear in the Oct. 1, 1924, issue of the Journal of Electricity.

JOB FINISHED DURING MAY, 1924

%	TOTAL PRIME COST	%	GROSS PROFIT	%	OVERHEAD	%	NET PROFIT	%
47	2470	70	1070	30	1100	31	470	9
44	1370	65	1070	35	910	30	360	10
44½	3000	66⅔	1500	33⅓	1000	23½	500	10
40	1650	60	1100	40	687	20	413	15
47	4070	70	1770	30	1307	31	417	9
47	3270	70	1380	30	1060	23	320	7
41	2660	60	1740	40	1100	20	640	15
43	2540	60	1710	40	1067	20	643	15
57	4000	70	1570	30	1232	22	343	8
42½	2400	66⅔	1220	33⅓	857	23⅓	363	10
46	29600	66⅔	14800	33⅓	10360	23⅓	4440	10

Fig. 1.

after the sheets covering the jobs completed during the month under survey are taken from the active binder and before they are placed in the finished binder. The totals of the selling price, material and labor costs, gross profit, overhead expense and net profit of these individual jobs should agree with the amounts as shown in the above example, which are also identical with the figures that will be shown later in the monthly profit and loss statement. With these total amounts in agreement, they constitute a final proof that the entire work in connection with the detailed job cost sheets has been handled correctly.

The value of such information as contained in Figs. 1 and 2 is paramount to the management of a business as it shows at a glance the exact result of each job upon its completion, and from which the proper corrective measures when needed can be taken on any similar jobs in the future. Without information of this nature readily at hand a business is bound to be operated more or less in the dark, and the results of this method of operation are known generally to prove fatal. These summaries show the net result of each job upon its final completion for future guidance, but through the continual reference to the detailed job cost sheets and work in process statements the results of each job can be watched very closely while in progress, and any necessary corrective measures as to their handling taken before the completion. The Work in Process statement is particularly valuable in respect to showing each job in process so that the proper measures can be taken to expedite the completion of the jobs that appear to be dragging along for an unreasonable length of time, and consequently tying up capital unnecessarily.

As will be readily seen from the foregoing illustrations, all statements and data prepared dovetail right into one another and after the detailed cost system is once properly started the amount of clerical work entailed in its operation is reduced to a minimum by this same regularity of routine. There is surely no safer nor saner method of accounting than this, as all work remains in process on the books until completed and no profits on jobs are taken into account until that time.

Electrical Construction

By E. Earl Browne

FIGS. 17, 18, 19 and 20 in this issue together with Fig. 14 in the Aug. 15 issue of the Journal of Electricity, go to make up a set of five forms issued by the Association of Electragists, International, which are designed to be used with the association's "Manual of Estimating." It will be noted in Fig. 17 that six columns have a heading "Pipe Entrances" with subheadings "Ceiling" and "Wall." The association's method of estimating labor is probably more accurate than any yet devised as under that scheme a job is divided into its logical parts and classified as to type of construction of floors, walls and ceilings.

When taking off a job it is necessary to count

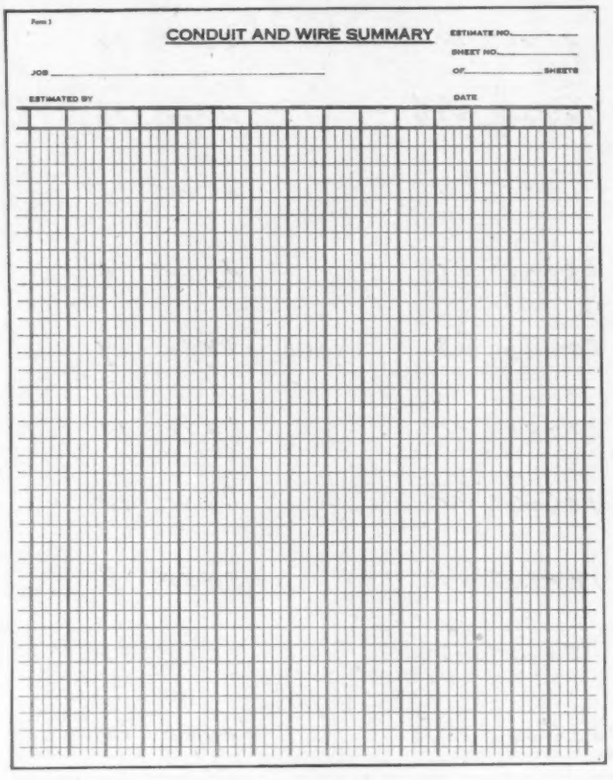


Fig. 18.

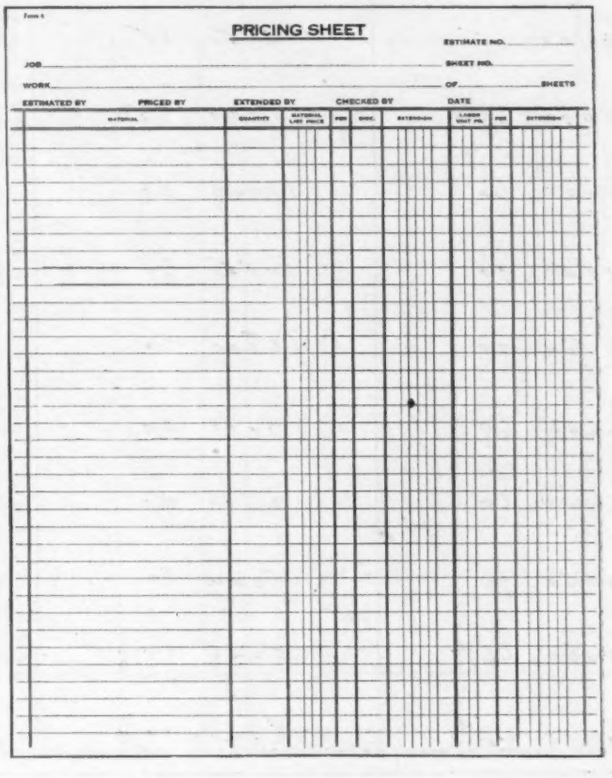


Fig. 19.

the pipe entrances into ceiling, bracket, switch and convenience outlets and list them under their proper headings as to size (½ in., ¾ in. and 1 in.). The only objection to the association's form No. 1 is that the separate circuit conduit and wire listings are not kept in permanent form as explained in the issues of the Journal of Electricity of July 1 and July 15 of this year.

This could, however, be done by using an extra sheet of form No. 3 (Fig. 18). It will also be noted that in addition to a space for the estimate number there are two spaces for numbering of the sheets, which is a very important feature as it is a very easy matter to omit one of the sheets, and it is for that reason that the writer is in favor of the use of as few sheets as possible—such as those shown in the May 1 and May 15 issues of the Journal of Electricity. In listing the conduit on Form No. 4 (Fig. 19) the labor subdivision must be noted as the unit per hundred feet is one amount for branch circuit work and another amount for feeders and motor circuits, the latter being subdivided as to method of installation; i.e., if the motor circuits and feeders are in floor slab the unit would be 25 per cent less than if they were run exposed on wall or ceiling, which is worthy of note if there be a considerable quantity of each. Also, in listing wire of No. 10 and larger sizes it is necessary to list the number of runs and also the runs containing less than 150 lb. of wire in addition to those runs that require more than that amount.

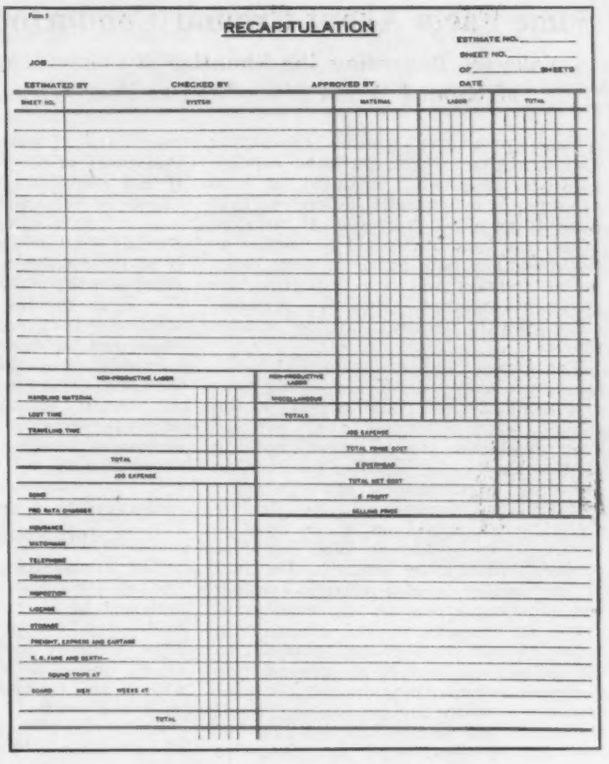


Fig. 20.

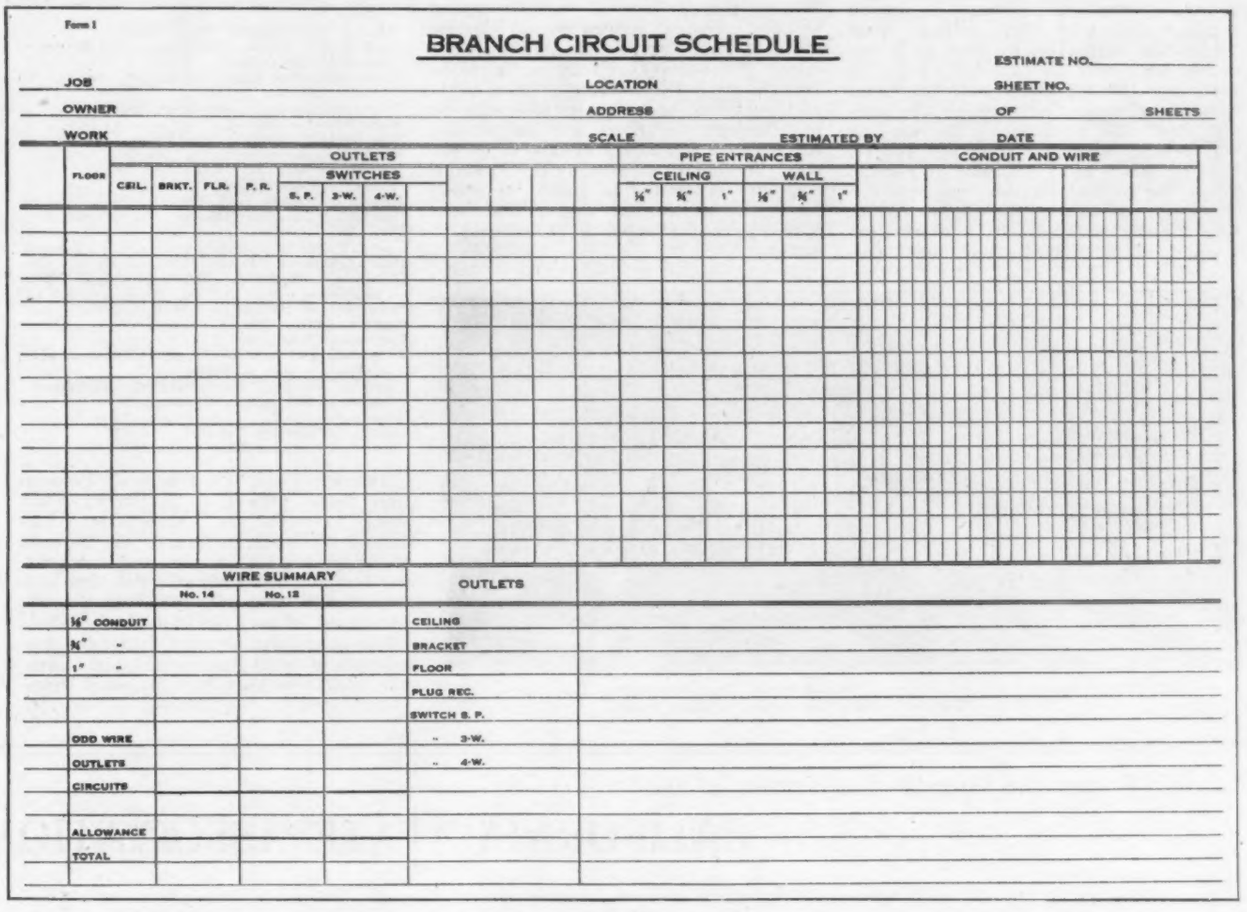


Fig. 17.

Some Facts About Ground Conductors in Conduit

Fallacies Regarding the Shunting of Conduits and the Bonding of Ground Wires Often Lead to Poor Wiring Practice

Both protective ground conductors and lightning arrester ground conductors are frequently installed in iron conduit. It is generally understood that a lightning arrester ground, if installed in an iron conduit, should be bonded to the conduit at both ends. In some cases public utilities and city inspection departments require protective grounds, when run in conduit, to be bonded thereto.

The general impression is that bonding a conductor to the containing conduit eliminates the choking effect of the conduit, which otherwise is very serious, even on 60-cycle current, to say nothing of the higher frequencies involved in lightning disturbances, etc. In some instances, particularly where flexible conduit or armored cable is used, a separate wire is used to bond (or more properly, shunt) the conduit. The fact of the matter is that neither bonding nor shunting a conduit appreciably reduces the choking effect. Shunting a conduit is not in any way beneficial so far as the resistance of the ground wire contained within the conduit is concerned. Bonding the ground wire itself to the conduit simply has the effect of substituting the conduit for the wire and the benefit derived from doing so depends upon several things.

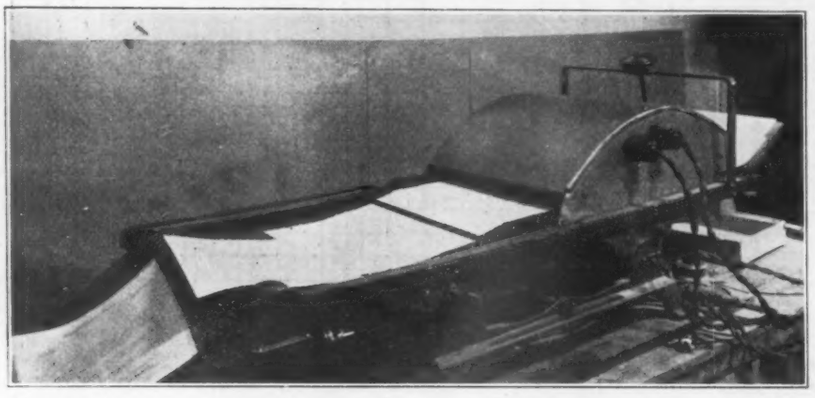
If a No. 8 copper conductor is run in ½-in. steel conduit and a short circuit ground current of 250 amp. is passed through the wire, the voltage drop across the conductor, as soon as it becomes hot, will be approximately 70 volts per 100 ft., whereas if the same current be conducted through the conduit itself the drop across the conduit will be only about 25 volts per 100 ft. It is therefore apparent that by substituting the conduit for the conductor the effective resistance of the circuit will be very greatly reduced. It is interesting to note, at this point, that under the conditions of current flow stated, the resistance of the No. 8 conductor itself, if not contained in conduit, would be about 50 volts per 100 ft.

If the wire is contained in a flexible conduit or steel armored cable, bonding is of little value so far as low voltage, short circuit, 60-cycle currents are concerned, as the resistance of the conduit or armor is greatly in excess of the resistance of the conductor contained within it, and there is, therefore, no material reduction in the resistance of the circuit. However, in order to properly take care of high frequency disturbances, bonding is highly desirable in every case.

Electricity Used to Dry Ink on Job Printing Work

The drying of job printing work is one of the new tasks that has been assigned to electricity by the Panama Stationery Company, San Francisco. This company has taken an electric dryer, designed for use in connection with process embossing work, and has used the device in the drying of job printing work to speed up production on rush orders. Through the use of the machine the time required for the drying of the ink has been reduced from a period of hours to one of minutes.

The dryer consists of four 500-watt heaters placed over a variable speed endless conveyor driven by an electric motor. The degree of heat and the speed of the conveyor may be varied to suit the job. Form letters, notice cards and varieties of printing jobs can be put through the dryer and the job delivered in a few hours in case of necessity. The device as used by the Panama company is limited to sheets of about 12 in. in width, but larger machines with a greater number of units could be designed.



Electric dryer for quickly drying job printing work.

Code Committees Established in Seventy-One Cities

Since the last convention, the Association of Electragists, through its Code Committee, of which A. Penn Denton is chairman, has endeavored to set up throughout the country local code committees composed of representatives of the several branches of the industry. It is now possible to announce for the first time the cities in which such committees have been organized.

Sixty-nine cities in the United States and two in Canada, a total of seventy-one cities, have organized local code committees. In commenting upon the enthusiasm with which this idea was received by the industry, Mr. Denton said:

"I am very enthusiastic over the way our membership and the other branches of the industry locally, throughout the country, have taken to this work and I believe we have undertaken an educational work in the study of code and ordinance conditions in the larger cities of this country that will have a far-reaching effect in improving the business of our members wherever this is done, as well as obtaining invaluable data for the use of the electrical committee in its next code revision work."

Cities in which local code committees have been organized are as follows:

Alabama—Birmingham, Mobile.
Arkansas—Hot Springs, Little Rock.
Colorado—Colorado Springs, Denver.
California—San Francisco.
Connecticut—Hartford, New Haven, Waterbury.
Florida—Jacksonville, Miami, Tampa.
Georgia—Atlanta, Columbus.
Illinois—Decatur, Galesburg, Springfield, Peoria, Joliet.
Indiana—Indianapolis, Terre Haute.
Iowa—Cedar Rapids, Davenport, Des Moines.
Kentucky—Louisville.
Kansas—Kansas City, Pittsburgh, Salina, Topeka, Wichita.
Louisiana—New Orleans, Shreveport.
Massachusetts—Boston.
Maryland—Baltimore.
Minnesota—Minneapolis, St. Paul.
Mississippi—Jackson, Vicksburg.
Missouri—Kansas City, St. Joseph.
New York—New York City.
Nebraska—Lincoln, Omaha.
New Jersey—Newark.
North Carolina—Raleigh.
Ohio—Columbus, Dayton, Springfield.
Oklahoma—Muskogee, Oklahoma City, Tulsa, Okmulgee.
Pennsylvania—Pittsburgh, Wilkes-Barre.
South Carolina—Charleston.
Tennessee—Memphis.
Texas—Dallas, Fort Worth, Houston, Beaumont, Galveston, San Antonio.
Virginia—Newport News, Norfolk, Richmond.
Wisconsin—Milwaukee, Sheboygan.
Washington, D. C.
Canada—Winnipeg, Toronto.

Denver, Colo., Contractors' Association Moves Offices.—The Denver Electrical Contractors' Association has moved its headquarters to the Nevada Building, 532 17th Street, and is operating temporarily without a full time secretary and field man pending the appointment of such an individual. E. A. Scott, prominent Denver electragist and member of Scott Brothers Electric Company, is serving as secretary and treasurer.

Don't Forget the Annual Convention of the

CALIFORNIA STATE ASSOCIATION OF

L. LUNKHEAD LAMPOONED STUCK WITH STILETTO

By JOE OSIER

Louie Lunkhead, the prize dumb gluck west of Chicago, had the dice and the floor at a recent meeting of a certain contractor-dealers' association and—

He was throwing fours and twelves and nothing else and each time he opened his mouth, he proved by his own statements that he was named correctly, for—

Let it be broadcast from stations A to Z, Louie was a phathead right—he was always wrong and proud of it, and his opinions were as valued as a—

Fur coat in flytime.

Before he was "counted out" at this particular meeting, Louie, with waving hands and bleating voice, declared that any man who put out prunes for advertising was in the line for inspection by a lunacy commission, adding—

"I never spent one dime for ads. Nobody reads 'em. Nobody believes 'em. Nobody ever got nothin' from buying

Louie finally does some advertising.

this here, now, white space. It is money like throwin' it in the bay.

"When I get the glue, I keep it, and some day, when I have enough, I'll buy myself out of this business and go into a game where a man can make a livin'."

Then, Mister Lunkhead was aimed for an exit and the meeting was resumed.

Louie, like many others in the electrical industry, refused to believe that advertising or not is merely a question of moving merchandise or not—and—

He ridiculed the idea that to stop advertising is to stop greeting old friends and to stop making new ones; in fact, Louie couldn't see the point and that was the reason—

Bankers turned their backs on him—jobbers slipped him the yes, we'll advance you no credit—and

Why he was trying to buy himself out of the business. And—any men who share Louie's views are wrong.

They are as wrong as a wrong number—as wrong as a last month's transfer—as wrong as near beer and—

If they persist in holding these opinions, they are paging poverty, signaling the sheriff to foreclose them and calling for Katy Calamity to come; and—

Because I know I am right and Louie et. al. Louies are wrong, I hereby take up the gavel, pound for order and rule the contrary-minded out of the—

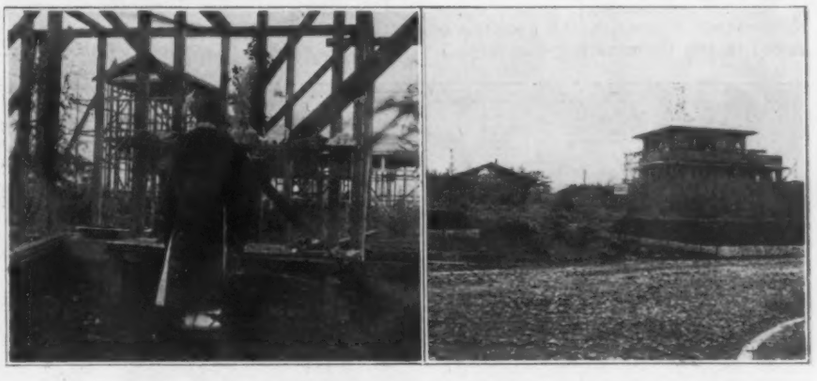
Electrical League for Enlightenment.

Japan's First Electric Home Is Being Built in Tokyo

By F. D. FAGAN
Advisor to Tokyo Electric Company

The erection of the first electric home in Japan, plans for which were made by a committee appointed by the sales manager of the Tokyo Electric Company, has been under way for several months and is to be completed Sept. 20. The home is a six-room Japanese and foreign style building and is located in one of the exclusive suburbs of Tokyo.

The work of securing cooperative effort to arrange for the home was undertaken by the central station committee and as there was no organized association in the city a real estate company, building company, department store, electric railway company, electrical manufacturing company and a lamp company agreed to build and furnish the home. Building of the home was started in June of this year and during the early stages of construction, on the day that the rafters supporting the roof were put in place, the Japanese ceremony of blessing the home was conducted by a Shinto priest.



Shinto priest blessing first Japanese electric home and the home as it appeared in later stages of construction.

Lighting Campaign Plans Formed by San Diego Club Men

Organization of a local committee in San Diego, Calif., to cooperate with and further the Home Lighting Educational Campaign was perfected through the San Diego Electric Club at its meeting on Aug. 19. The action was taken following a meeting held with representatives of the electrical industry of San Diego the week previous during a brief visit to the city of J. M. Hickerson, representing the national organization of the campaign.

To hear Mr. Hickerson explain the general scheme of the campaign, and to have the plan for organization outlined, a group of about twenty representatives of the contractors, dealers and central station were called together by A. E. Holloway, Aug. 13. Mr. Hickerson was not able to remain over in San Diego until the next meeting of the Electric Club.

Accounting Problem Questions Answered by Expert

The Journal of Electricity has made arrangements with F. V. Mitchell, public accountant of San Francisco, to answer, in these columns, such questions as may be asked on accounting. All readers are invited to forward their inquiries to The Editors, Journal of Electricity. The answers will be published as soon as possible following the receipt of the inquiry.

Question:
How should the proprietor's drawings be treated on the books?

Answer:
A journal entry should be made debiting expense and crediting the proprietor's personal account with a reasonable salary allowance monthly, and all withdrawals charged against this personal account. If the proprietor draws a regular monthly salary in cash, this amount can be debited direct to expense and no journal entry is necessary.

OF ELECTRICAL CONTRACTORS AND DEALERS

Santa Cruz, California—September 19, 20, 21, 1924

JOBBER, DEALER AND SALES AGENT

Helping the Industry to Sell Modern Lighting

Seventy-Seven Men Learn Fundamentals of Selling Lamps and Lighting in Ninth Illumination Design Course

By ROY A. PARKER
National Lamp Works of General Electric Company

"Know your stock!" is the advice that the sales manager of a large retail establishment has been giving to his salesmen for over a period of ten years. It is this man's opinion that the first requirement of the salesman is that he be thoroughly acquainted with the things he hopes to sell to the customer.

The selling of electrical devices is a fairly technical pursuit and consequently the salesman must have a comprehensive understanding of his product. He must be exceptionally well acquainted with the applications of his devices and must also be prepared to assist the customer in fitting the equipment to the particular need.

One of the fields in which sales managers have not had opportunity to give complete information to their salesmen is that of commercial and industrial lighting. The field is becoming a highly technical one and it is necessary that adequate information be in the hands of the men that meet the public in an effort to sell this class of merchandise.

To aid in the education of men that are interested in the sale of better lighting installations, the National Lamp Works of the General Electric Company, in June, 1921, started at Nela Park, Cleveland, Ohio, what is known as the "Illumination Design Course." This course is open to all persons engaged in the illuminating industry.

Those in attendance at these schools knew that there is more to the lighting business than the mere selling of lamps. They knew that if they were qualified to design and specify good lighting for a customer instead of selling lighting equipment for a hit-and-miss installation, they would increase their sales and build the good will of their customers. They knew that if they understood the fundamental principles in the procedure of selling lighting they would again add to their ability to increase sales.

The course is given periodically three times a year. Lectures and demonstrations covering theory and principles of lighting are given by recognized authorities in each field. Typical factories, offices and stores are visited and lighting layouts are designed for them. Theory and practice are thereby joined to give a thorough training to the student. Street lighting, sign lighting and automobile lighting are also studied and demonstrated.

Having obtained a working knowledge of illumination, the student has effective sales ammunition at his command. Lectures embracing merchandising principles, advertising, and selling are given to the student. These talks show the student how to use the sales ammunition that he has acquired. Contracts, sales rules, surveys of the various markets and the methods of developing them are discussed in lectures with a view to aid every man expand his business.

The newly completed demonstration rooms at Nela Park were used for the first time by this school. The demonstrations in these rooms helped those attending the course to visualize the facts and principles brought out in the lectures.

The entrance to the demonstration rooms leads into a reception room or lounge. Adjoining this room is a class room which is equipped with special demonstration lighting fixtures, a stage for demonstration purposes, tables equipped with individual drawers for each student's books, papers and working materials, and demonstration booths along the sides of the room showing the most up-to-date lighting equipment. Individual rooms containing equipment for the demonstration of industrial lighting, home lighting, street lighting, automobile lighting, show window lighting, sign lighting and sales helps enable the visitors to obtain in a short time a most comprehensive idea of the modern methods of lighting and the benefits from good lighting as contrasted with bad lighting.

Two schools, similar in character to those at Nela Park, are to be conducted in California by the Lighting Bureau of the Pacific Coast Electrical Association within the next month. The first group of men will receive instruction at a school to be held in the auditorium of the Pacific Gas and Electric Company Building in Oakland, Sept. 22-26, and the second course will be given in the Contractor-Dealers' Association Building in Los Angeles, Sept. 29-Oct. 3.

Street lighting demonstration room and the reception room at the Nela Park demonstration quarters. Individual exhibits are provided for demonstrating various classes of illuminating equipment.

WESTERN dealers in electrical appliances have been among the most enthusiastic supporters of national campaigns sponsoring various electrical devices. During Hotpoint Window Display Week, featured by the Edison Electric Appliance Company, many of these dealers devoted their windows to the exclusive display of this line. Five of the windows are reproduced on this page. Reading from left to right and top to bottom the windows are those of: Hamburger's, Los Angeles; Collonan Electric & Manufacturing Company, San Francisco; Wilson Electric Company, San Francisco; Valley Electrical Supply Company, Fresno; and Union Electric Company, Pasadena. Over five hundred California dealers participated in the window decorating campaign.

INDUSTRIAL NEWS

Public Ownership Bill May Be Presented in Oregon

To bond the State of Oregon and put it into the business of generating and selling electrical energy is the aim of a constitutional amendment that may be submitted to the state legislature which will convene early next year. A committee of eight from the Public Ownership League, which was organized in Portland about a year ago under the auspices of the Public Ownership League of America, is reported to have drawn up the amendment. The advocates of the measure state that if the amendment is submitted to the legislature and that body does not introduce it for preliminary consideration, or in any manner changes its provisions, it will be withdrawn and placed on the 1926 general election ballot by initiative petition. The intent of the bill is declared to be to conserve, develop and control the waters of the state by publicly owned utilities.

A board of five to be elected by the people and to serve without compensation would administer the provisions of the Act. The board is given power "to issue and sell bonds, to construct or acquire by purchase, lease or condemnation, gift or other legal means, water, water rights, easements, or electrical energy, and to construct and operate works, dams, reservoirs, power houses, transmission lines, structures, roads, railroads and any other property necessary or convenient for the purpose of the act." It is provided, however, that no plant shall be purchased for a consideration of more than $500,000, until such purchase shall have been approved by a vote of the majority of the legal electors of the state or political subdivision thereof at a general election.

A revolving fund of $5,000,000 is provided which would be used to defray the expenses of acquisition, construction and operation and maintenance of projects undertaken by the board. If at any time the revenues from projects are insufficient to pay the interest and principal on outstanding bonds the board may issue and sell bonds to meet such payments. The board would have full power to establish rates for service which in its judgment would provide for all operating expenses and interest and principal on bonds and retire the investment in a project in fifty years. The state and political subdivisions are given a preferential right to water and electric energy controlled by the board as against privately owned public utilities selling water or electric energy to the public.

In any proceeding in eminent domain brought by the board the determination of the board that the taking of the property described in the complaint is necessary shall be conclusive evidence of such necessity. In any proceeding the state may take immediate possession and use of any property deemed necessary by paying into court such amount of money as the court may determine as reasonably adequate to secure to the owner immediate payment of just compensation for such taking and damage incident thereto.

Court Denies Injunction to Stop Work on Municipal Plant

A temporary injunction sought by the Colorado state utilities commission, restraining the City of Loveland, Colo., from continuing its work on a municipal plant, was denied by Judge George H. Bradfield of the district court at Fort Collins, Aug. 26.

The City of Loveland, Mayor W. E. Banks, members of the city council, the contracting firm doing the work, and the Hendrie & Bolthoff Manufacturing & Supply Company of Denver, were named as defendants. Previously Wayne C. Williams, attorney-general of Colorado, refused legal aid and denied the right of the commission to engage attorneys with which to institute action against the defendants.

It is not known whether the matter will now be taken into the federal courts or whether the differences between the municipality and the Public Service Company of Colorado will be settled by arbitration. Disposition of the distribution system owned and operated by the latter company is the principal subject of concern.

Date Fixed for Hetch Hetchy Bond Election.—Oct. 7 has been fixed by the San Francisco Board of Supervisors as the date of the special election on the proposed $10,000,000 Hetch Hetchy bond issue (Journal of Electricity, p. 184, Sept. 1, 1924). Of this amount $8,000,000 is to cover the cost of driving the 17-mile tunnel from Moccasin Creek into the San Joaquin Valley, and $2,000,000 is allotted to shafts and other preliminary work on the 31-mile tunnel yet to be driven through the Coast Range Mountains separating the San Joaquin Valley from San Francisco Bay. Neither the cost of the Coast Range tunnel nor the 45-mile pipe line across the San Joaquin Valley is included in the forthcoming bond issue.

El Paso Electric Railway Employees Hold Picnic.—The annual "Fall Round-Up" of the El Paso (Texas) Electric Railway Company employees was held at West Ysleta Country Club, El Paso, on Sept. 5. The picnic was featured by various races and ended with moving pictures and dancing.

Files Argument Against Proposed Water and Power Act

State Senator Arthur H. Breed of Alameda County, Calif., has filed with the California Secretary of State an argument against the proposed Water and Power Act. In accordance with the law, it will be made a part of the biennial booklet on proposed new laws sent to all voters in the state prior to election. The argument follows:

The pending water and power constitutional amendment is the same measure which the people rejected two years ago by a majority of nearly 354,000.

It pledges the state's credit to an issue of $500,000,000 of tax-free state bonds. A board of five persons, appointed by the governor, would spend the money in acquiring, operating and maintaining such water and power projects as it deemed necessary or convenient.

This political board would operate the projects from Sacramento, fix rates and determine conditions and quality of service, all without regulation by the Railroad Commission. Consumers and communities would thus be at the mercy of five politicians with a virtually unrestrained control of industry. Should incorrect estimates, inadequate service or political mismanagement prevent projects from paying expenses or meeting interest charges or requirements for repayment of principal out of rates, explicit provision is made to meet deficits and losses out of the general funds of the state.

The board is empowered to appoint such employees as it may require and fix their compensation. These employees are exempted from the state civil service law, so that the board can build up a great political machine through patronage.

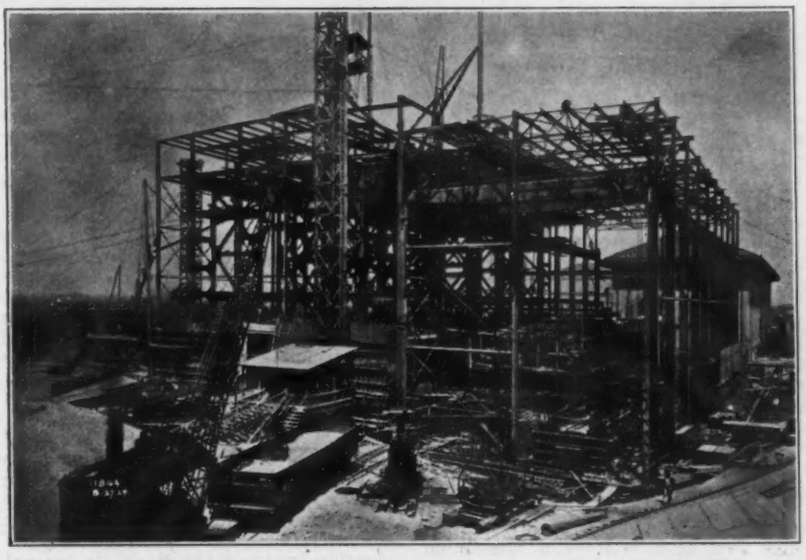
This year advocates of the measure seek to take political advantage of the drought by masking the water and power amendment as a water conservation plan, but public ownership will not increase rainfall. Behind the existing dams the storage basins are almost dry. What California needs is more rain, not more empty reservoirs.

There is no public need for the state to embark in the power business and no good reason for adding half a billion dollars of tax-free bonds to the huge volume of such securities outstanding. Many advocates of the water and power measure, undismayed by the failure of North Dakota in the wheat and banking businesses favor the Act as a first step in California toward the taking over by government of essential industries and the redistribution of private wealth through taxation. There is no more reason why the state should adventure into the power business than into the flour or automobile business.

Less than fourteen years ago the state undertook effective regulation of public utility companies. As a result the rates, investments and service of such companies are now controlled by a public agency. To scrap the policy of regulation and substitute public ownership would be unjust and foolish. Even those who assert that regulation has failed cannot logically offer as an improvement a new commission appointed like the Railroad Commission by the governor and given the insufficiently restricted power of expending the taxpayers' money and hiring armies of employees.

Private initiative and effort developed California. Political management is usually wasteful and inefficient, and to compel taxpayers to provide enormous amounts of borrowed money for the financing of unspecified ventures by a political machine would be to invite disaster.

The voters should rebuke by a majority larger than before the restless agitators who refuse to accept the decision of the people so emphatically expressed. Repeated submission of such measures is a public nuisance and tends to bring the initiative into disrepute.



Long Beach steam plant of the Southern California Edison Company as it appeared Aug. 27, 1924.

Long Beach Steam Plant Unit Received in Record Time

Breaking all previous records for transcontinental freight shipments by over two days, a special trainload of 22 cars of electrical equipment for the Long Beach steam plant of the Southern California Edison Company arrived in Los Angeles on Aug. 31, after being en route from Schenectady, N. Y., 7 days, 18 hr. and 40 min. The equipment for the 100,000-hp. addition to the Edison company system which included the largest steam generating unit ever shipped west of Chicago, left the factory of the General Electric Company 9 weeks ahead of schedule and will be in service some time during November of this year. It was originally planned to place the unit in service Feb. 1, 1925. The plant is being rushed to completion to relieve the power shortage in southern California.

In endeavoring to speed up the trip across the continent, the General Electric Company sent a personal tracer along with the train. Excellent cooperation was received from the railroad companies and when the train arrived at Power, the site of the new plant, Southern California Edison Company crews were ready to unload the equipment.

Close co-ordination throughout the plants of the General Electric Company made possible the delivery of the equipment in record time. When the contract was signed in January, promise of shipment was made for October. Work in the company plants was speeded up so that on Aug. 23 all of the apparatus had been received at Schenectady and the special train was started from there that night.

The equipment shipped included the following: one 35,000-kw., 1,500-r.p.m., 11,000-volt, 50-cycle turbo-generator; one 2,800-kw., 1,500-r.p.m., 2,300-volt, 50-cycle generator; one 45-kw. direct-connected exciter; two motor-operated field rheostats for main and auxiliary generators; five 100-hp. and five 150-hp. motors; one solenoid-operated field rheostat for exciter; three 73,000-volt, 400-amp. oil circuit breakers; six 13,500-kva., 50-cycle, 72,000-4,100-600-11,000-volt transformers; one 350-kw. motor-generator set and other auxiliary equipment.

Stone & Webster, Inc., under whose direction the $10,000,000 plant is being constructed, is also rushing work on the structure. At the present time over 1,000 men are being employed on the project in order that the new unit may be put in service at an early date.

Rocky Mountain League Appoints Lighting Contest Board

The Rocky Mountain Electrical Cooperative League is sponsoring the Better Lighting Contest that is being promoted nationally under the direction of the National Electric Light Association and the Society for Electrical Development. A committee has been appointed to handle the details of the contest in the Intermountain territory and plans are now under way for vigorously promoting the plan.

The committee personnel is as follows:

C. Louis Collins, executive secretary, Rocky Mountain Electrical Cooperative League, chairman.
E. E. Brazier, representing jobbers.
S. Smith Stevens, representing manufacturers.
J. V. Buckle, representing contractor-dealers.
O. J. Hyde, representing Mountain States Telephone & Telegraph Company.
M. L. Cummings, Jr., representing central stations.

City and Power Company Contest For Sultan River Rights

As a counter move in the conflict for water rights on the Sultan River, between the city of Everett, Wash., and the Sound Power Company, New York, the company has filed a protest in the office of Marvin Chase, state supervisor of hydraulics, against the application of the city for permission to use an additional 50 sec.-ft. The city already has a permit to appropriate 20 sec.-ft., and the protest claims that this is sufficient for the next fifty years, and that the additional filing is for political purposes.

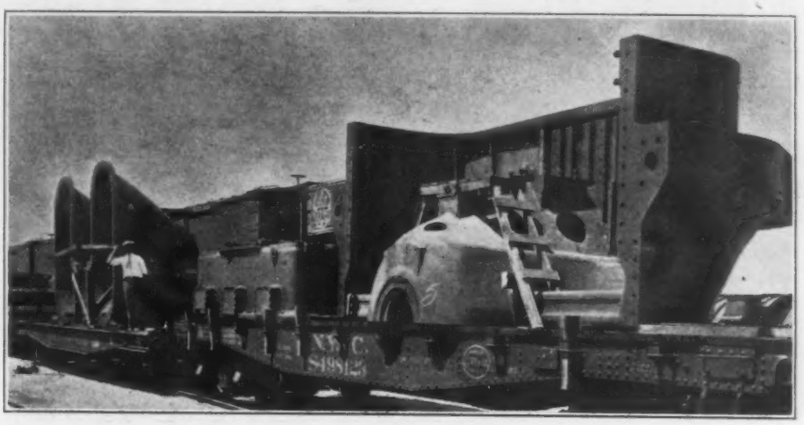
Recently the city entered protest against the granting of any further permit to the Sound Power Company to develop a hydroelectric project on the Sultan River, claiming that it needed all the waters of the river for domestic purposes. The protest was in the form of a resolution passed by the city council, addressed to the Federal Power Commission, setting forth the claim that, because the company has not carried on any development work since the granting of the temporary permit two years ago, it was not entitled to any extension of this permit. The resolution asserted that the city contemplated a $1,000,000 improvement on the river for domestic water purposes in the near future.

Additional Power Site Applied for by Port of Kalama

In a supplemental application recently filed with Marvin Chase, Washington supervisor of hydraulics, the Port of Kalama, Cowlitz County, Wash., asks permission to divert 500 sec.-ft. of water from the Kalama River for the purpose of developing 11,350 hp. at a projected hydroelectric plant.

The application also asks for reservoir rights on a site capable of impounding 1,000 acre-ft. of water, which is to be used at a 250-ft. head. The water is to be conveyed to the power plant through a conduit line 7¼ miles long and the probable cost of development is placed at $1,100,000.

The Port of Kalama has recently asked for tentative rights on several power sites adjacent to the city, intending to choose the most feasible later, according to report. It is understood that much of the power is to be used for operating a paper plant, the construction of which is under contemplation.



Base and shell of 35,000-kw. turbo-generator upon arrival at Long Beach plant.

Construction on Baker River Project Under Way

Stone & Webster Making Fast Time on Large Hydro Development For Puget Sound Power & Light Company

Construction on the Baker River development of the Puget Sound Power & Light Company, Seattle, Wash., is being pushed along rapidly with 900 men employed on the river and 300 men on the substations and transmission lines, according to W. D. Shannon, general superintendent of Stone & Webster, Seattle, who has charge of the work. The initial installation is scheduled for completion in the fall of 1925 and is estimated to cost $7,800,000.

A camp has been established at the site of the project near Concrete, Wash., just above the confluence of the Baker and Skagit Rivers, and a railroad has been extended from a connection with the Great Northern at Concrete, past the camp and on to the site of the dam.

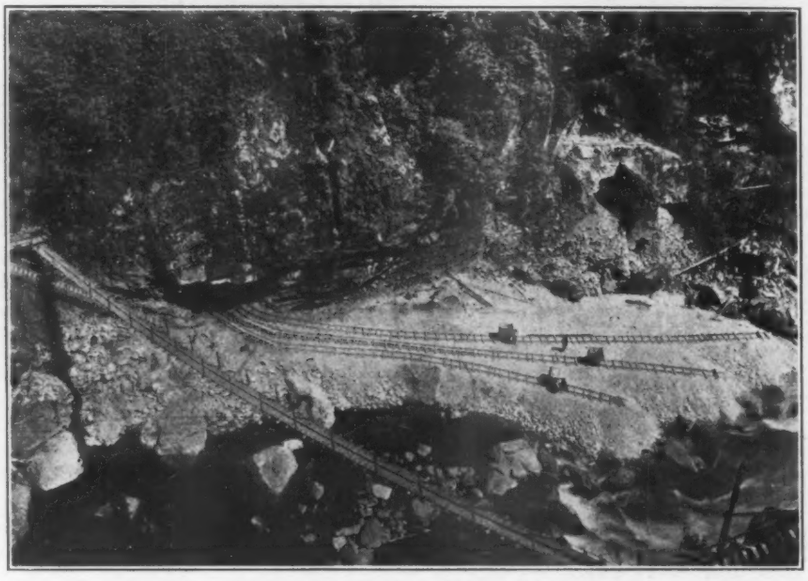
A diversion tunnel, capable of carrying the entire flow of the river, has been drilled through a side of the canyon, and the stream was diverted through it around the dam site in August. Cofferdams are now being constructed above and below the site preparatory to unwatering the stream bed so that actual construction on the dam can be started. Loose material on the side of the canyon at the sites of the dam and power house has been washed down by hydraulic giants, and an incline railway has been built from a point a half-mile upstream from the dam for the purpose of bringing in sand and gravel for the concrete structures. This railway will be cable-operated and electrically driven.

The dam, which is to be built at a narrow gorge of the canyon, will be 245 ft. high, 180 ft. thick at the base, and 400 ft. long on the crest, and will contain 120,000 cu. yd. of concrete. Just above it, the Baker River flows through a flat valley, varying in width from one-half to one mile, which will be flooded by the impounded waters, creating a reservoir of about 70,000 acre-ft.

The main pressure tunnel, to carry the water of the reservoir to the penstocks, has been partly bored as a section of the diversion tunnel. It will be 24 ft. in diameter and 1,300 ft. long, lined with concrete, and of a capacity sufficient to furnish the total expected development of 80,000 hp. Gates and rack bars will control the input at the head of this tunnel, and a surge tank will be installed near the lower end.

In the immediate development, two short steel penstocks, from the lower end of the pressure tunnel, will connect with two 20,000-hp. water wheels, of a make and design not yet determined, driving two 18,000-kva., 6,600-volt generators, likewise not specified as to make and design. The concrete power house will be laid out with the total possible future development in view.

Connection with the company's system will be made by 110-kv. line 25 miles west to a 13,500-kva. substation at Sedro-Wooley. From here the energy will be transmitted 25 miles to Bellingham at 60 kv., and south 45 miles to Everett at 110 kv., where a 27,000-kva. substation will be built. The Everett line is now under construction and will be operated at 60 kv. on completion about Oct. 1, to improve service in that vicinity. The other two lines will be constructed next year.



South portal of diversion tunnel at site of Baker River plant of the Puget Sound Power & Light Co.

Offer Made for Colorado Springs Property Outside of City.—The Colorado Springs, Colo., city council has made an offer of $800,000 to the Colorado Springs Light, Heat & Power Company for all of its property and rights outside the corporate limits of the municipality. This follows closely on the track of the agreement of the company to sell to the city its plant and distribution system within the city limits for $600,000. In the meantime it is understood that the company is planning on concluding its commercial operations as soon as possible, regardless of the legal difficulties which yet remain to be settled before the city can take title to the system as approved at a special election several months ago.

Injunction Suit Filed Against California Power Company

Suit has been filed at Fresno, Calif., in the Superior Court against the Southern California Edison Company of Los Angeles, Calif., to enjoin temporarily that company from storing the waters of the San Joaquin River.

The plaintiffs, Amelita Herminghaus, Bertha G. Bottoms and Victoria Pearl Womach, own 17,000 acres of land lying along the San Joaquin River at its junction with Fresno Slough and covering twenty-two miles of river front. It is claimed that this land has riparian rights to the flow of the river. The holding has been leased for many years to the Miller & Lux Land Company, but it is claimed the lease does not affect the water rights.

In the course of the development of its hydroelectric projects on the headwaters of the San Joaquin River, the Southern California Edison Company has secured from the Miller & Lux company, which has large holdings of riparian lands on the river, its consent to the water storage. The plaintiffs claim that this agreement does not affect their interests, and allege that the storage by the Edison company, in its proposed hydroelectric development at Florence and Huntington Lakes and at other points on the upper reaches of the river, will damage their land by preventing "a very favorable overflow of water which has abundantly fertilized the land and take away water necessary for its irrigation when the land shall be intensively cultivated."

It is stated that this legal action comes after a year and a half of unsuccessful negotiation to effect a mutually satisfactory settlement, and the temporary injunction is sought until an agreement has been reached. The value of the land and water titles involved is claimed to be more than $2,000,000.

Electric Utility Incorporated in Denver.—The Hydro-Electric Company has been incorporated in Denver, Colo., by three local men. The plan of the incorporators is to supply electric energy to ten Colorado counties, including Denver. According to Karl C. Schuyler, Denver attorney and one of the incorporators, the company owns water rights on two rivers, the two sites being capable of developing 54,000 hp. Frank M. McMahon, Denver business man, and G. A. Tass, electrical engineer, who built the Pikes Peak hydroelectric plant at Colorado Springs, are the other incorporators.

Albany Company Acquires New Property by Purchase.—Announcement has been made of the purchase of the properties of the Stayton Light & Power Company, Stayton, Ore., by the Mountain States Power Company, Albany, Ore. The rates of the selling company prevailing at Stayton have been adopted and made effective by the purchasing company. Though the exact point of contact has not been determined, it is stated that the Stayton system will be tied in with that of the Mountain States Power Company by an 11,000-volt line.

California Telephone Association to Meet at Santa Monica.—The California Independent Telephone Association is to hold its next meeting at the Athletic Club, Santa Monica, Calif., Sept. 25-26.

Electrification of Oregon Farms Surveyed by Committee

The rural electrification survey in Oregon, announced at the Northwest Electric Light and Power Association convention in June, is well under way. The work is being carried on by F. O. McMillan, professor of electrical engineering, and W. J. Gilmore, agricultural engineer, both of the Oregon Agricultural College, Corvallis. These men were appointed by the Oregon committee on the relation of electricity and agriculture.

The intent of the survey is to find out to what extent the farms in Oregon are electrified and what use is being made of electric service. Data are being gathered on the number of lamps used, the amount and kind of motor load, the number of kilowatt-hours consumed per customer, and the inventory of various rural lines. These data will facilitate negotiations between farmers and power companies for line extensions in the future, since they reveal average conditions in several typical farming communities in the state.

Surveys have been conducted near Jefferson in the Willamette Valley, a general farming country served by the Mountain States Power Company; near Salem, Willamette Valley, general farming, served by the Portland Electric Power Company; near Hillsboro, Tualatin Valley, served by the Puget Sound Power & Light Company; near Astoria, general farming and dairying, served by the Pacific Power & Light Company; and near Tillamook, dairying, served by the Coast Power Company. A continuation of these surveys will be made in the Hood River Valley, fruit farming, served by the Pacific Power & Light Company; near LaGrande, grain and irrigation, served by the Eastern Oregon Light & Power Company; near Ontario, hay, grain and stock farming, served by the Idaho Power Company; and in southern Oregon, fruit and general farming, served by The California Oregon Power Company.

The plan of such a survey grew out of a meeting called by President W. J. Kerr of the Oregon Agricultural College, to cooperate with the activity initiated by the National Electric Light Association, and attended by a number of farmers, utility company representatives and members of the staff of the college. At this meeting the Oregon committee was chosen, consisting of about forty members representing all the interests present. This committee chose from its members an active executive committee to be headed by J. T. Jardine, director of experiment stations of the college, and containing among others G. A. Palmiter, master of the state grange, R. H. Dearborn, dean of the college of engineering, Oregon Agricultural College, L. A. McArthur, vice-president and general manager of the Pacific Power & Light Company, A. C. McMicken, sales manager of the Portland Electric Power Company, and P. O. Crawford, vice-president and chief engineer of The California Oregon Power Company.

Annual Outing Held by Salt Lake City Electrical Industry

The annual "get-together" outing of the electrical people of Salt Lake City, Utah, and surrounding territory was held at Lagoon, a summer resort about fifteen miles north of Salt Lake City, on Aug. 19. The Rocky Mountain Electrical Cooperative League, which each year since its organization has conducted such an outing, had charge of the affair, and it was pronounced the most successful in the history of the industry in this section.

An entertaining program of varied events, which were participated in by men, women and children, furnished a good time for everybody during the afternoon. In the evening those present listened to an address by Lawrence W. Davis, manager of the Association of Electragists, International.

Some of the interesting features of the afternoon's program were the baseball game between delegations from Salt Lake City and Ogden, the men's bathing review and the ladies' bathing review, mashie approach (50 yd.) for men, and mashie approach (25 yd.) for ladies.

More than 300 members of the industry, with their families, were present at the picnic. The members of the committee in charge of the affair were: L. B. Johnson, General Electric Company; Geo. P. Trayner, Utah Power & Light Company; W. A. Moser, Westinghouse Electric & Manufacturing Company.

Annual Report Is Published by Denver Electrical League

The annual report of the Electrical Cooperative League of Denver, Colo., has been published and is in the hands of the members of the league. Included in the comprehensive report are summaries of the various activities engaged in by the league during the past year as well as plans for the coming twelve months.

According to the report the league staff has been active during the past year, 1,228 calls having been made on persons that had the ability to increase the electrical installations in Denver homes and buildings. The staff also prepared wiring plans for many installations and devoted attention to better commercial lighting. Results of the work are shown by the fact that the average number of outlets in all types of houses built in the city during the year ended June 30, 1924, was 25, whereas the previous year the number was 21.

The plans for the coming year include the assuming of leadership in the activity being sponsored by the Lighting Educational Committee; the forming of closer contact and cooperation with the electrical contractors; continued developing of better commercial lighting and the general developing of the electrical idea in the territory covered by the league.

City Wants to Sell Its Municipal Power Plant.—As a step toward culminating negotiations between the City of Scio, Ore., and the Mountain States Power Company, Albany, Ore., for the sale of the city's municipal power plant and system to the company, the city council has instructed the mayor to proceed with the necessary legal steps. The company has offered the city $42,500 cash and certain street lighting concessions bringing the total consideration to about $45,000. This offer is acceptable to the city council, but will have to be confirmed by vote of the people, and it is likely that a special election will be called for the purpose. It is understood that, if the deal is consummated, the power company will tie the Scio property in with its own system.

More than 300 people attended the annual picnic of the Salt Lake City electrical industry.

Present Status of Development of Skagit Project

Water Has Been Turned Into Tunnel and Construction on Crib Dam to Divert Flow from River Has Been Started

Shrouded in mystery, beset by mishaps and rumors of mishaps, threatened with lawsuits and investigations, the Skagit development of Seattle, Wash., is still unproductive at the time of going to press. President Coolidge was to have pressed the button on Sept. 1, but this act was delayed. In the meantime, water has been turned through the tunnel without the aid of the crib dam and the machines are being tested. Construction of the crib dam has commenced.

The Gorge tunnel situation has been complicated by the acceptance of the tunnel by the board of public works and the presentation by R. C. Storrie & Company, contractors on the tunnel job, of a bill of extras amounting to over $600,000.

A resolution passed by the city council Aug. 21, urging the board of public works not to accept the tunnel, has further complicated the situation. The board already had accepted the tunnel on Aug. 9, though George F. Russell, chairman of the board, informed the council that this action would not bind the city to any course of action on the Storrie claim. However, a legal question has been raised as to whether or not the action of the board might be construed as a waiver by the city of several irregularities in the tunnel work. Hope was expressed that settlement of the claim might be effected without recourse to the courts.

The city council on Aug. 28 abandoned its proposed investigation into the responsibility for the 340-day delay in the completion of the tunnel. Counsel and witnesses for both sides were present when Chairman Russell of the board of public works informed the assembly that C. F. Uhden, engineer of the Skagit project, would not be present. He explained that Mr. Uhden was preparing a detailed report on each item of the Storrie claim, and that this report would be transmitted to the board through J. D. Blackwell, city engineer. He said that the board would consider the reports of both engineers, make such other investigations as it saw fit, and submit its recommendations to the council.

In a communication to the city council Aug. 23, alleging weaknesses in the equipment of the Skagit plant, the Seattle Local Number 46 of the Electrical Workers' Union urged an investigation of the entire project and of the city light department by the department efficiency committee. Asking investigation of the light department, the communication asserts that "Local 46 feels that the engineering in connection with the plant is bad, the commercial conduct of affairs, scandalous, and the executive management, abominable." The communication was referred to the department efficiency committee.

Work on the crib dam, included as part of the initial Skagit development to aid in regulating the flow of water through the tunnel, has been commenced within the past month. Completion is expected in six to eight weeks, but operation of the plant will not be delayed on this account, it is declared. Some doubt has been voiced that this type of dam will not stand up under the freshets of the Skagit River. The next step in the complete development of the Skagit project calls for a masonry dam at this point 240 ft. high.

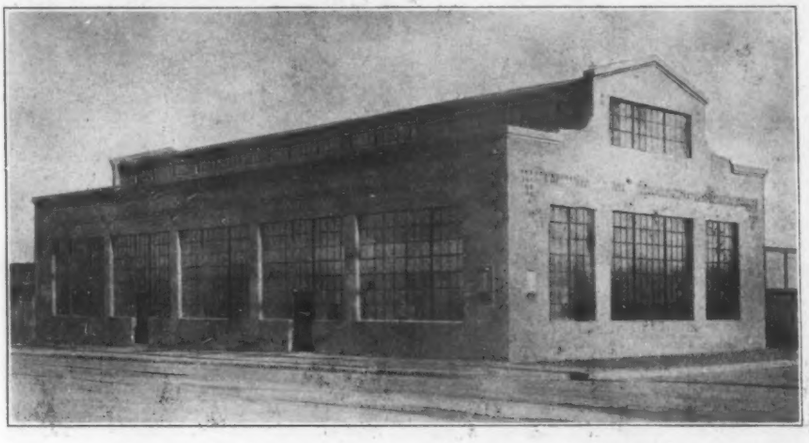
New Electric Repair Shop Put in Service at San Diego

The new electric repair shop of the San Diego Consolidated Gas & Electric Company, recently put in service, embodies several features of unusual construction and equipment. Perhaps the most notable of these is that the building and its transformer platform are designed with a view to doubling their size when the demands of the system call for additional capacity. The enlargement can be accomplished without disfiguring or disturbing the present layout.

The repair shop has been built on the west half of a small block. The building is 50 x 100 ft. in floor space, with a transformer platform of the same size adjoining it on the south. When the need for expansion is felt, the east end of the building will be opened and the walls extended another 100 ft., and the transformer platform will receive similar treatment.

Equipment of the shop consists of a traveling overhead crane in the shop itself, a traveling gantry crane on the platform outside, in addition to a 6-ton electric hoist for use in loading. An electric and steam oven, for drying out transformers and motors, is also a feature of the new shop. An oil purifying set, consisting of a filter press and a centrifugal separator, has just been installed.

Test equipment includes a portable test set, for 2 kv. to 14 kv., and stationary sets to test from 2 kv. to 22 kv., from 2 kv. to 200 kv., a 200-kv. static voltmeter, and a portable oil test set for voltages up to 220,500. The switchboard equipment is designed for tests on 110, 220, and 440-volt circuits, either single or three-phase. It has a capacity of 50 kw.



The new electric repair shop of the San Diego Consolidated Gas & Electric Company, built so that the demands of expansion may be met by lengthening the building.

New Distribution Cable Crosses Willamette River

Preparing for increased demands, the Northwestern Electric Company, Portland, Ore., recently completed laying a new distribution cable to carry three-phase current at 11,000 volts across the Willamette River from the foot of Lincoln Street on the west side to connect with the Sellwood distribution circuits on the east side.

This cable, which is the fifth to be laid across the river by the company, also completes the 11,000-volt loop between the Albina substation and the Lincoln Street steam plant of the company. These stations, located in remote ends of the city, were formerly connected by only one line traversing the city on the west side through the Pittock Block station. The gap now is closed between the Lincoln Street station and the line extending through the city on the east side from the Albina station to the Sellwood district, thus securing greater stability to the continuity of service.

The cable is 1,400 ft. long, and, after the necessary preparations had been made, was laid on the river bottom in about twenty minutes with the aid of the cable barge of the Pacific Telephone & Telegraph Company.

Illinois Wire & Cable Company to Open Pacific Coast Plant.—Production of weatherproof wire and cable will be started at the new plant of the Illinois Wire & Cable Company, Oakland, Calif., on Sept. 15. The first unit of the company's Pacific Coast plant has recently been completed and is housed in a structure 320x80 ft. A. M. Mueller, Western manager for the company, has announced that Pacific Coast orders for weatherproof wire and cable will be handled through the new office.

San Joaquin River Watershed Permits Granted to Southern California Edison Company.—Eighteen permits covering hydroelectric developments in nearly the entire San Joaquin River watershed above the 1,000-ft. level, have been issued to the Southern California Edison Company by the California Division of Water Rights. These permits are in line with the company's extensive program of additional water power developments, the entire completion of which will require a continuous building program extending over a period of eighteen years. The program involves the expenditure of approximately two hundred million dollars.

Municipal Hydro Development on Wynooche River Held Up

Blocked in its attempt to further its water and power project on the Wynooche River by the adverse decision of Judge Wilson of the Superior Court for Grays Harbor County, the city council of Aberdeen, Wash., has directed the city attorney to appeal the case to the State Supreme Court. Judge Wilson's decision, which was the outcome of a suit brought by Frank O. Dole, taxpayer, asking for an injunction restraining the city from going ahead with the project for which $2,000,000 in bonds had been voted last December, stated that the plan of the project as outlined by the city contained two separate and distinct projects, one to provide domestic water and one to furnish light and power, which could not properly be joined under one bond issue as contemplated. Under the decision, the special election, in which the bond issue was approved by a majority vote, was declared invalid, and an injunction was granted restraining the city from further action on the project.

The special election was authorized by an ordinance outlining the project, which consisted of building a dam 240 ft. high across the Wynooche, tunneling 1½ miles to the headworks of the present city water supply on the Wishkah River, erecting at the dam a power house and installing equipment capable of generating 34,000 hp., constructing a transmission line to Aberdeen and a substation and distributing system in Aberdeen, and providing for a bond issue of $2,000,000 to furnish funds for the project. This ordinance was presented to the city council on Nov. 14, 1923, sixteen days before the date of the election, at the instigation of City Attorney Cross and other supporters, and at that same meeting rules were suspended and the ordinance was put through its final passage.

In the meantime the question of water rights on the Wynooche is being considered by the Federal Power Commission, having been presented to that body at a public hearing July 30, 1924, conducted by Philip H. Dater, district engineer of the Forest Service, Portland, Ore., the Forest Service having been brought into the matter by reason of the fact that the development lies within the Olympic National Forest. At this hearing, briefs were presented by the City of Aberdeen and by the Grays Harbor Railway & Light Company, Aberdeen, Wash., both of which are contesting for the site.

Prior state rights to the waters of the Wynooche for power development are owned by J. E. Malinowski, of Aberdeen, who filed in November, 1921, and received a permit from the state to develop the site. Later filings recorded are that of the Grays Harbor Railway & Light Company in August, 1922, and that of the City of Aberdeen in December, 1923. It is understood that Mr. Malinowski does not desire to develop the project, and, failing to sell his rights to the power company, is negotiating with the municipality for such sale.

The history of the agitation for the development of the Wynooche dates back several years. In March, 1922, the hydroelectric committee of the county council met with officials of the power company, and agreed to the company's proposal for taking care of increasing power load by the installation of a 3,000-kw. steam unit in one of its existing plants. At the same time the company agreed to make investigations on the Wynooche, which was then thought to be the most practicable development nearby. In August, 1922, the company filed its application for water rights and commenced its investigations on the river extending over three months. In November, 1922, it placed in operation the 3,000-kw. steam unit, and in the summer of 1923 it continued its work on the Wynooche.

Pit 3 Tunnel Crews Advance One Heading 600 Ft. in August.—Crews working on Heading No. 1 and the Pit 3 tunnel of the Pacific Gas and Electric Company drove and completely timbered the tunnel a distance of 600 ft. during the month of August. This is regarded as notable in view of the fact that the tunnel is 22 x 23 ft. in size and that it was driven through three kinds of rock—tuff, agglomerate and seamy diorite. The total distance driven in August at all five headings was 2,375 ft. and it is now expected that the tunnel will be completed by Jan. 1 and that the plant can be put in operation by July of next year.

Bids for Narrows Span Received.—Preliminary examination of the fifteen bids received on the power transmission span across the Narrows of Puget Sound, between Point Evans and Tacoma, as part of the Lake Cushman power project under development by the city of Tacoma, showed that the low bidders on the three principal contracts were as follows: Ward & Ward, Tacoma, for foundation work; Pittsburgh-Des Moines Company, Seattle, for superstructure; Clyde Equipment Company, Seattle, for cable. Work of itemizing the bids and completing their tabulation is under way, but will require a little time before the awards are made. The bids ranged from $261,000 to $350,000, all exceeding the original estimate of $250,000.

Books and Bulletins

PRACTICAL CALCULUS FOR HOME STUDY

By CLAUDE IRWIN PALMER. 443 pages, 186 figures. $3. Published by McGraw-Hill Book Company, Inc., New York, N. Y.

To write a book covering the principles of the calculus as applied to practical engineering problems is quite a task, but to attempt to write such a book so that the subject may be mastered by home study without the aid of an instructor is indeed a real undertaking.

According to the author, who is associate professor of mathematics at the Armour Institute of Technology, "Many men without college training have need for a working knowledge of the calculus and its practical applications, but there has been no book available that could give them the essentials of the subject without the assistance of an instructor."

This book aims to give the man who has a limited mathematical training the ability to make use of the calculus as he needs it in his work. It is intended further to be an extension of the author's "Practical Mathematics" published a few years ago.

In the section immediately following the preface and entitled "A word to the student," the author gives a bit of sound advice to those who attempt to master the calculus. Among other things he says that the thing to be desired is for one to appreciate what calculus really is, to understand its fundamental principles and to realize what a powerful tool it is in formulating the laws of nature. And also—"One should not allow himself to be lured on merely because a subject is represented as easy; but he should assure himself that every problem he attacks, . . . has a useful purpose, in that it will contribute in some measure to the perfecting of his mathematical equipment. The subject of calculus cannot be made easy, but it can be made plain."

The book then starts with a chapter on Fundamental Ideas followed by chapters on Limits, Derivatives, Curves and Their Equations, Maxima and Minima, Differentials, Rate of Change, Integration, Trigonometric Functions and Three Important Types of Functions. In the last named chapter under the section devoted to the periodic functions an excellent example is given of the care used by the author in preparing the student's mind for the subject which is to be treated. In this particular section the statement is made:

"In nature there are many motions that are recurrent. Sound waves, light waves, and water waves are familiar examples. Motions in machines are repeated in a periodic manner. The vibration of a pendulum is a simple case, as is the piston rod motion in an engine. Other familiar illustrations are the vibration of a piano string, breathing movements, heart beats, and motion of tides. An alternating electric current has periodic changes. It increases to a maximum value in one direction, decreases to zero and on down to a minimum, that is, to a maximum value in the opposite direction, rises again, and repeats these changes."

Chapters then follow on Curvature, Methods of Integration, Plane Areas, Arc Lengths, Partial Integration, Double and Triple Integration, with the Applications of Integration. The book concludes with chapters on Series, Analytic Geometry, and answers to the problems given throughout the book. The diagrams are clear and well drawn, and in keeping with the lucid explanations of the text.

For the student who is seeking to expand his knowledge of mathematics and for the engineer who would like to keep from getting rusty on his calculus, a text book such as this should be most welcome and useful.

E. R. S.

Bulletin on Self Corrosion of Lead Cable Sheath Published.—The Engineering Experiment Station of Purdue University has recently published Bulletin No. 18 which is entitled "Self Corrosion of Lead Cable Sheath." The booklet was written by F. O. Anderegg and R. V. Achatz and covers various experiments conducted under the direction of the two professors.

Meetings

Plans Made For Pacific Coast A.I.E.E. Convention

Plans for the Pacific Coast convention of the American Institute of Electrical Engineers have been formulated by the committee in charge and a tentative list of technical papers has been prepared. The convention is to be held at Pasadena, Calif., Oct. 13-17, and indications are that it will be one of the most successful ever held. A large number of engineers and pioneers of the electrical industry from the East East will attend the convention in a party and will make the trip in special cars, visiting points of interest en route.

The tentative program of papers is as follows:

Transmission

The Hysteresis Character of Corona Formation, Prof. H. J. Ryan and H. H. Henline, Stanford University.
Corona Losses between Wires at High Voltage, C. Francis Harding, Purdue University.
Corona-Loss Tests on 202-Mile, 220-Kv. Transmission Line, Roy Wilkins, Pacific Gas and Electric Company.
Corona Losses from Large Cables, J. C. Clark, Stanford University, and F. F. Evenson, Benson Lumber Company.
Heating of Large Aluminum Transmission-Line Cables, R. J. C. Wood, Southern California Edison Company.
Lightning, E. E. F. Creighton, General Electric Company.
Lightning and Other Transients on Transmission Lines, F. W. Peek, Jr., General Electric Company.
A New Type of High-Tension Insulator, H. B. Smith, Worcester Polytechnic Institute.
High-Voltage Line Insulation, A. O. Austin, Ohio Insulator Company.
Limitations of High-Voltage Transmission, H. H. Dewey and T. A. Worcester, General Electric Company.
Transmission at 220 Kv. on Southern California Edison System (composite paper by members of Southern California Edison Company):
Section 1. Description of System and Operating Experience, H. Michener.
Section 2. Protective System, E. R. Stauffacher.
Section 3. Economic Studies in Transmission-Line Design, W. D. Shaw and C. B. Carlson.
Section 4. Vibration of Conductors and Overhead Ground Wires, J. M. Gaylord.
Section 5. Location and Right of Way, V. D. Elliott.
A High-Voltage Wattmeter, P. C. Clark and C. E. Miller, Stanford University.
Power Measurements at High Voltages and Low Power Factors, J. S. Carroll, T. F. Peterson and G. R. Stray, Stanford University.

Machinery

Large Steam-Turbine Generators, W. J. Foster, E. H. Freiburghouse and M. A. Savage, General Electric Company.

Operating Practice

Operating Features and Technical Problems Associated with Interconnected Systems, W. E. Mitchell, Alabama Power Company.

Research and Electrophysics

(The eight papers following are by members of Norman Bridge Laboratory of Physics, California Institute of Technology.)
Influence of Temperature on Photo-Electric Emission, R. C. Burt.
Collisions of the Second Kind, Stanslaw Loria.
Electric Currents Due to Fields Alone, S. S. MacKeown.
Electronic Orbits in Atoms, R. A. Millikan and I. S. Bowen.
Transfer of Radiant Energy to Free Electrons, E. C. Watson.
Electronic Emission under the Bombardment of Positive Ions, A. L. Klein.
A Magnetic Lens, W. R. Smyth.
A Complex-Quantity Slide Rule, J. W. M. Du Mond.
A Method of Obtaining Steady High-Voltage D.C. from a Thermionic Rectifier without a Filter, F. W. Maxstadt, California Institute of Technology.

Utilization

Electrical Applications to Irrigation Pumping, R. H. Cates, Southern California Edison Company.
Electricity in the Cement Industry, Mr. Arnold, Southwestern Portland Cement Company.
Electric Power Application in Fir Mills, J. L. Wright, General Electric Company.
Electricity in Mines, F. L. Stone, General Electric Company.
Contribution of Electricity to the Steel Industry, K. A. Pauly, General Electric Company.
Electrical Equipment of Consolidated Mining and Smelting Company's Zinc Plant, R. H. N. Lockyer, West Cootenay Power Company.
Electrometallurgical Applications, J. L. M. Yardley, Westinghouse Electric & Manufacturing Company.

Telephony and Telegraphy

Guided and Radiated Energy in Wire Transmission, J. R. Carson, American Telephone and Telegraph Company.
Telephone Transmission Maintenance Practices, W. H. Harden, American Telephone & Telegraph Company.
Telephone Line Balance, L. P. Ferris and R. G. McCurdy, American Telephone & Telegraph Company.

Illumination

Street Lighting, R. D. Whitney, Syracuse University and Syracuse Bureau of Gas and Electricity.

Entertainment of members and guests in attendance at the convention has been arranged and numerous trips from Pasadena to points of interest have also been scheduled. Included in these trips is one to the observatory on Mount Wilson.

COMING EVENTS

California State Association of Electrical Contractors and Dealers—
Annual Convention—Santa Cruz, Calif.
Sept. 19-21, 1924

Pacific Division, Electrical Supply Jobbers' Association—
Quarterly Meeting—Del Monte Lodge, Pebble Beach, Calif.
Sept. 25-27, 1924

Association of Electragists, International—
Annual Convention—West Baden Springs, Ind.
Sept. 29-Oct. 4, 1924

American Institute of Electrical Engineers—
Pacific Coast Convention—Pasadena, Calif.
Oct. 13-18, 1924

Illuminating Engineering Society—
Annual Convention—Briarcliff Lodge, Briarcliff Manor, N. Y.
Oct. 27-31, 1924

Commercial National Section, National Electric Light Association—
Hotel Rafael, San Rafael, Calif.
Nov. 19-21, 1924

Public Relations Committee of P. C. E. A. Meets in San Francisco.—Plans for the activities of the Public Relations Committee of the P.C.E.A. for the coming year were outlined at the initial meeting of that committee held at the Palace Hotel, San Francisco, Aug. 29. At the meeting various suggestions for the maintaining of public relations were presented and discussed. The next meeting of the committee will be held in Los Angeles in November, the definite date not being determined.

P.C.E.A. Technical Executive Committee Holds Meeting.—Organization of the 1924-25 Technical Section of the P.C.E.A. was discussed at the first meeting of the Technical Executive Committee held at the Palace Hotel, San Francisco, Aug. 6. Sixteen members of the committee were in attendance and at that time the section's activities for the coming year were outlined. Subjects for the consideration of the various bureaus of the section were considered and bureau chairmen were appointed by P. O. Crawford, of The California Oregon Power Company and chairman of the section. A joint report involving power station arrangement was proposed and was received with general approval. This report is intended to cover lists of equipment entering into modern stations and is to be prepared by the Prime Movers, Apparatus and Hydraulic Power Bureaus. The next meeting of the Technical Section is to be held in Los Angeles, Sept. 17-19, instead of Sept. 18-20 as was announced on page 185, Journal of Electricity, Sept. 1, 1924.

P.C.E.A. Purchasing and Stores Section Holds Organization Meeting.—Eleven members of the Purchasing and Stores Section of the P.C.E.A. were in attendance at the organization meeting of that section, held in the Edison Building in Los Angeles, Calif., on Aug. 15. At that time H. O. McKee, chief traveling storekeeper, Southern California Edison Company, and chairman of the committee, presented to the membership a booklet containing a list of subjects that might be discussed at the section's meetings together with a brief outline for the preparation of papers under each subject. Members of the committee were appointed to the various subcommittees and were asked to prepare papers upon the subjects assigned. Following the meeting the membership made a trip of inspection to the new general store of the Edison company at Alhambra. The next meeting of the section will be held at Del Monte, Nov. 20-21.

COMING PACIFIC COAST ELECTRICAL ASSOCIATION MEETINGS

Technical Section—
Southern California Edison Building, Los Angeles, Calif.
Sept. 17-19, 1924

Executive Committee, Commercial Section—
Los Angeles, Calif.
Oct. 17-18, 1924

Power Bureau—Technical Section—
Los Angeles, Calif.
Oct. 17-18, 1924

Executive Committee, Commercial Section—
San Francisco, Calif.
Nov. 19-21, 1924

Purchasing and Stores Section—
Del Monte, Calif.
Nov. 20-21, 1924

Power Bureau—Technical Section—
San Francisco, Calif.
Nov. 20-21, 1924

Rocky Mountain Division of N.E.L.A. Holding Convention.—A number of new features are promised at the convention of the Rocky Mountain division of the National Electric Light Association now being held at Glenwood Springs, Colo., according to telegraphic reports from the publicity committee. One record has already been broken and that is the number of registrations prior to the opening of the convention. Better lighting is one of the chief subjects on the convention program.

Manufacturer, Dealer and Jobber Activities

Western Electric Company at New York has recently opened a branch office at Davenport, Iowa. E. L. Johnson has been appointed manager of the Davenport branch and D. O. Manix stores manager.

The Tri-State Electric Company, wholesale electric supplies, located at 108 Prefontaine Place, Seattle, has been taken over by the **Globe Electric Company, Inc.** The sale which involves all the interests of the Tri-State company means that the company's offices and shop will be closed, and the activities of the concern transferred to the Globe company's quarters at 312 Second Avenue.

Russell Electric Company, Chicago, Ill., has placed on the market two new curling irons, one with a rod 5¼ in. long and 5/16-in. in diameter, the other with a rod 6½ in. long by ⅜-in. diameter. Both devices have a separable plug in the handle to permit of ease of operation.

The F. W. Wakefield Brass Company, Vermilion, Ohio, has issued a folder entitled "This Is All You Need" which is designed to emphasize the ease and simplicity of conducting a central station store lighting campaign. The booklet is devoted to an explanation of the plan developed by T. O. Kennedy, general sales manager of the Ohio Public Service Company, and outlines the ten essential steps in the campaign and gives examples of the inexpensive advertising material which has proved successful in the seven cities where this activity has been carried on.

The Cutler-Hammer Manufacturing Company, Milwaukee, Wis., has placed on the market a new combination pendant switch and receptacle that is designed for use with kitchen lighting units. The device is arranged to control the lighting unit and at the same time take any appliance. The two features are independent of each other, the receptacle being direct-connected so that whether the light switch is either on or off, any appliance may be plugged in and operated. The device is also adaptable for controlling commercial and industrial lighting units.

The Griscom-Russell Company, New York City, has recently published form sheet No. 195 devoted to the G-R Bentube evaporator which is designed for the production of pure distilled water for boiler feed make-up. A full description of the evaporator is contained in the sheet.

Allis-Chalmers Manufacturing Company, Milwaukee, Wis., has published Bulletin No. 1632-G covering "Centrifugal Pumps and Pumping Units." The booklet is replete with illustrations and descriptions concerning adaptations of the company's line of pumps in industrial and other plants. A complete description of the various types of pumping unit is also presented in the book.

The Esterline-Angus Company, Indianapolis, Ind., has published Bulletin No. 624 which deals with the operation of its multiple chart speed meters. Wiring diagrams showing the installation of the meters are also presented.

Morse Chain Company, Ithaca, N. Y., has recently prepared four publications dealing with Morse chains. One of the booklets gives a history of the application of power from the 17th to the 20th century, while the other three show pictorially applications of the company's line of power transmission chains.

Curtis Lighting, Inc., Chicago, Ill., has recently placed on the market two large-sized X-Ray reflectors designed to eliminate daytime plate glass reflections in show windows. The reflectors are designed to secure illumination of high intensity when used with the 500-watt Mazda lamp. The reflectors are designated as No. 900 X-Ray Giant and No. 910 X-Ray Leviathan.

Here we have the doughty "Mike" Scanlon, advertising manager of the Westinghouse Electric & Manufacturing Company, San Francisco, Calif., ready to throw the bull. Mike, who emigrated from East Pittsburgh to California about three years ago, looks like a "sure-nuff" vaquero.

Majestic Electric Appliance Company, Inc., San Francisco, has recently reduced list prices on Nos. 107, 108, and 111 Majestic electric heaters.

Wagner Electric Corporation has recently moved its San Francisco offices from 159 New Montgomery Street to 457 9th Street in that city.

The Poindexter Supply Company, for a number of years at 1440 Stout Street in Denver, Colo., has moved to the building of another jobber, the New England Electric Company, at 1591 Lawrence Street. Although the two firms are not merging it is understood that they will be closely co-ordinated.

C. A. Eastman, Pacific Coast representative of the Davis Sewing Machine Company, manufacturers of the Blue Bird washing machine, has recently moved his headquarters to 301 Times Building, Portland, Ore. The sales and service activities of the Blue Bird washer for the Pacific Coast are carried on from these headquarters.

The Lionel Corporation, New York City, has recently published its 1924-25 catalog of Lionel toy trains. The 44-page catalog is printed in four colors and gives a complete description of all toy trains manufactured by the company.

International Creosoting & Construction Company, Galveston, Texas, has prepared for distribution a 36-page booklet devoted to International pressure creosoted Southern Yellow Pine poles. The booklet is designed for users and presents in a most complete and accurate manner information and tabulated data on creosoted pine poles. Included in the booklet is a description of the processes involved in the preparation of creosoted poles. Numerous illustrations are used to enable the reader to visualize the operations. The tabulated data include information on the life of poles, physical properties of poles, standard pole volumes, and pole specifications. The booklet will be sent to interested parties upon request.

The Economy Fuse & Manufacturing Company has moved its district headquarters from Seattle, Wash., to Denver, Colo., with F. L. Easton in charge.

Pacific Electric Manufacturing Company, San Francisco, Calif., has recently published Bulletin 14000, which is devoted to a description of that company's line of high-tension switches known as Type 14000. The bulletin contains a full description of the parts and assembled switches of this design, together with illustrations showing various switches. Switch weights, dimensions, prices and general data concerning the Type 14000 switches are also presented in the booklet.

The General Electric Company has published Bulletin No. 48721 which presents pictorially examples of annealing of castings and wire, heat treating, calorizing, sherardizing and other processes using electric furnaces. The publication is mostly pictorial in content, illustrating the application of this type of heat to various operations in the plants of the General Electric Company. Details as to heat, dimensions and function of each installation shown are given in descriptive captions.

Westinghouse Electric & Manufacturing Company has recently developed a new reflector for use in industrial operation where a highly concentrated light is desired over a limited area. The reflector has been designed to give the maximum light distribution from a 25 or 50-watt mill type lamp, insuring a high intensity of illumination over the working area. In such work as machine sewing, coil winding, and other operations requiring accurate vision, the reflector is particularly suitable. The body of the reflector is a one-piece steel stamping to which is applied a ground coat of fired porcelain enamel and then a finishing coat of enamel, green on the outside and white on the inside.

Roller-Smith Company, New York, N. Y., has published Bulletins No. 160, No. 560 and No. 240. Bulletin No. 160 supersedes price sheet for Bulletin No. 160 and is devoted to the Roller-Smith type GSA, a.c. portable instruments. Included in this bulletin is a description of the new type GSA volt-ammeter that has recently been developed by the company. Type GSA wattmeter furnished for two-current capacity is also illustrated in the bulletin. Bulletin No. 560 supersedes the issue of that bulletin dated September, 1923, and is devoted to "Safety" circuit breakers of the enclosed Type P design and of the nonclosable on overload Type E design. Roller-Smith precision torsion balances are described in Bulletin No. 240 which supersedes the issue of May, 1921.

Personals

Fred B. Lewis, who has for some time past been acting and assistant manager of operations of the Southern California Edison Company, Los Angeles, Calif., has been made assistant general manager of that company. Mr. Lewis started with the company immediately after his graduation in electrical

FRED B. LEWIS

engineering and has remained in the service for nineteen years. His work with the Edison company has been in various capacities and during the recent water shortage he has had part in the co-ordination of plans for the interchange of power. Mr. Lewis has been connected with many of the developments of his company and has taken an active part in system extensions.

R. F. Cole, for some time with the Economy Fuse Company as salesman in the Northwest territory, has left that company to become manager of the lamp department of Fobes Supply Company, Seattle, Wash.

S. W. Bishop, executive manager of the Denver Electrical Cooperative League, Denver, Colo., has returned from Association Island, N. Y., where he attended Camp Cooperation IV.

C. C. Shaw, of the Lalley Electric Company, Portland, Ore., was a recent visitor to San Francisco, Calif.

Murray Bourne, of the San Joaquin Light & Power Corporation, Fresno, Calif., was recently in San Francisco on business.

M. L. Brown, formerly with the Pacific Gas and Electric Company, San Francisco, Calif., as range and appliance salesman, has joined the staff of A. Strauch and H. V. Mooney, San Francisco. Mr. Brown will spend his time in the promotion of electric heating and cooking business.

H. F. Jefferson, until recently general manager of the Kilbourne & Clarke Manufacturing Company, 101 Spokane Avenue, Seattle, has severed his connection with that firm and established consulting electrical engineering offices in the Pacific Block.

Victor Hartley of the San Francisco office, California Electrical Cooperative Campaign, was a recent Los Angeles, Calif., visitor.

H. A. Storrs, chief engineer of the Modesto Irrigation District, Modesto, Calif., was a recent visitor to Oakland on business for the district. Mr. Storrs is interested in the negotiations now pending between East Bay cities and San Francisco for the use of Hetch Hetchy water.

C. H. Talmage, for over twenty-two years with the Western Electric Company and for some years sales manager for that company at Salt Lake City, Utah, and Kansas City, Mo., has resigned to locate in California. Mr. Talmage will doubtless remain active in the electrical field.

R. A. Balzari and **"Steve" Gamble**, of the Westinghouse Electric & Manufacturing Company, San Francisco, Calif., recently spent several days in Sacramento on business.

Frank Waxon, of Waxon Brothers, electrical contractors and dealers of Sacramento, Calif., recently returned from a two weeks' motor trip to Santa Cruz and other cities.

D. K. Rivas has been made manager of the New York City office of the Wagner Electric Corporation, St. Louis, Mo.

H. J. Van der Bijl, chairman of the electricity supply commission of the Union of South Africa, is in California studying electrical development in that state.

John G. Barry, vice-president of the General Electric Company, of Schenectady, N. Y., was in Salt Lake City, Utah, during the latter part of August, conferring with Robert Miller, manager of the Salt Lake City office of the company.

Walter Wurfel, of the Electric Supplies Distributing Company, San Diego, Calif., was a visitor in San Francisco and vicinity during the early part of September.

P. H. Booth, Pacific Coast district manager of the Edison Electric Appliance Company, Chicago, Ill., is attending a sales conference at the factory.

J. C. Douglas, representative in northern California and Nevada for the Edison Electric Appliance Company, Chicago, Ill., is attending a sales conference at the factory.

Carl Heilbron, president and general manager of the Southern Electrical Company, San Diego, Calif., was tendered a surprise party at a recent weekly sales meeting of the company. Eighty-five employees and about fifty members of their families gathered for an evening of dancing and entertainment which terminated with a midnight supper.

Willis R. Dunbar, formerly with the Westinghouse Electric & Manufacturing Company, San Francisco, Calif., and now with the Equitable Life Assurance Company, has just returned from an extensive trip East where he attended a conference of the company's representatives.

Walter B. Ford, formerly electrical inspector in the department of electricity, City of Los Angeles, has accepted a position as instructor of electricity and radio at the Le Conte Junior High School, Los Angeles, Calif.

B. C. Watts, of Denver, Colo., is on an extended trip to Victoria, B. C., and other Northwestern points.

K. E. Van Kuran, district manager, Los Angeles, Calif., office, Westinghouse Electric & Manufacturing Company, recently spent several weeks at Del Monte.

W. A. Jones, of Henry L. Doherty & Company, New York City, attended the annual convention of the Rocky Mountain division of the National Electric Light Association held at Glenwood Springs, Colo., Sept. 15-17.

R. F. Buckles, branch manager of the Westinghouse Lamp Company in Seattle, Wash., has been transferred to the San Francisco, Calif., office of his company. He will be succeeded by **E. A. Irons**, who has been connected with the company for several years.

M. P. Canon, of Latourrette-Fical Company, electrical contractors of Sacramento, Calif., recently returned from a three weeks' trip through Oregon, Washington and British Columbia.

Richard M. Boykin, manager southern division, Puget Sound Power & Light Company, with headquarters at Portland, Ore., will leave for Seattle, Wash., the latter part of September to assume the position of manager of the central division of that company. He succeeds D. C. Barnes, who has been made a vice-president of the concern. The central division is the largest of the company. Included in it, beside the city of Seattle and the surrounding territory, are the hydroelectric plants of the company at Snoqualmie Falls, White River, Electron and the new Baker River development now under construction, as well as two large steam plants, several substations and many miles of transmission and distribution lines. Mr. Boykin brings to his new field a broad experience in matters electrical. Since his graduation from the Alabama Polytechnic Institute with a degree in electrical engineering, he has installed motors in South Carolina cotton mills, worked about the power dis-

RICHARD M. BOYKIN

tribution systems of Nevada mines, and owned and operated an electrical system in Oregon. This system was merged with the Washington-Oregon Corporation. which later was reorganized as the North Coast Power Company and Mr. Boykin was made vice-president and general manager. When the Puget Sound Power & Light Company absorbed the North Coast company he was appointed manager of the southern district. In June of this year he was elected president of the Northwest Electric Light and Power Association (Journal of Electricity, issue of July 15, p. 74). Mr. Boykin has been prominent in the activities of the local section of the A.I.E.E. and has a wide acquaintance among the electrical fraternity.

George M. Rankin, field representative of the California Electrical Cooperative Campaign, recently spent a week in Sacramento making an electrical census.

George A. Campbell, of the Truckee River General Electric Company, Reno, Nev., was recently in San Francisco, Calif.

William F. Raber, for the past thirteen years general manager of the Southern Colorado Power Company, Pueblo, Colo., has been transferred by H. M. Byllesby & Company to take over the management of the San Diego Consolidated Gas & Electric Company, San Diego, Calif. Mr. Raber succeeds H. H. Jones, who recently was transferred to Minneapolis, and Gen. George H. Harries, who assumed temporarily the management of the San Diego utility. Born in Ohio in 1871, Mr. Raber has devoted practically all of his life to the utility business, having started with the Central Union Telephone Company in Ohio in 1891. After remaining with that company for some time, he went into the electric light and street railway business at Mansfield, Ohio, a property then operated by H. M. Byllesby & Company. He was soon promoted to be superintendent and later became general manager. He is the second oldest Byllesby manager in point of service, although one of the youngest in years. In 1905 Mr. Raber was sent to Enid, Okla., to manage the Enid Electric & Gas Company. After a year he was made general manager of the Ottumwa Railway & Light Company of Ottumwa, Iowa. From this position he was advanced in 1911 to vice-president and general manager of the Arkansas Valley Railway, Light & Power Company.

WILLIAM F. RABER

This company, on expansion to include Pueblo, the mountain and valley divisions, which had previously been separate organizations, was renamed the Southern Colorado Power Company. Mr. Raber was particularly active in civic affairs in Pueblo and southern Colorado, having been one of the prime movers in connection with the Colorado State Fair. He was president of the Pueblo Rotary Club, and an officer of the Pueblo Chamber of Commerce. When the disastrous flood of 1922 nearly wiped out the city of Pueblo Mr. Raber, as director of the "Committee of One Hundred," was one of the most energetic workers in the reconstruction and rehabilitation of the devastated region.

K. A. McIntyre, of the Society for Electrical Development, attended the convention of the Rocky Mountain division of the National Electric Light Association held at Glenwood Springs, Colo., Sept. 15-17.

R. G. Gentry, manager of the bureau of public relations of the Public Service Company of Colorado, Denver, Colo., is spending some time on the Pacific Coast.

David E. Drake, connected with the electrical industry for more than fifty years, has retired from active service with the Westinghouse Electric & Manufacturing Company after an association of thirty-four years. Mr. Drake began his work in electricity in the laboratory of Thomas A. Edison in 1871, later becoming manager of the Newark, N. J., office of the American District Telegraph Company. In 1880 he was made superintendent of construction for the United States Electric Company, which was later absorbed by the Westinghouse company. Since 1894 he has been connected with the sales department of that company, specializing principally in street railway and power work. In the earlier part of his career Mr. Drake made many pioneer installations, among these being the first arc lamps in New York, in 1879, the first electric lights in Newark, and the first arc lights in Chicago, both in 1880. At a luncheon given in his honor at the Railroad Club, by officials of the Westinghouse company and members of its sales department, a purse filled with gold was presented to Mr. Drake.

K. E. Van Kuran, Los Angeles, Calif., district manager of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., was recently in San Francisco. While in that city he attended a meeting of the Advisory Committee of the California Electrical Cooperative Campaign.

Ralph J. Cordiner, special representative of the Edison Electric Appliance Company, Chicago, Ill., visited Spokane Aug. 29, en route from Chicago to Portland, Ore.

A. Emory Wishon, vice-president and general manager of the San Joaquin Light & Power Corporation, Fresno, Calif., was recently in San Francisco on business for his company.

D. F. McGee, formerly chief engineer of the Pacific Power & Light Company, Portland, Ore., now of the executive department of the Electric Bond & Share Company, New York, recently visited Portland.

R. M. Townsend, property agent of the Portland Electric Power Company, Portland, Ore., attended the Oregon Irrigation Congress at Klamath Falls Sept. 5 and 6.

L. A. McArthur, vice-president and general manager of the Pacific Power & Light Company, Portland, Ore., attended the Oregon Irrigation Congress at Klamath Falls Sept. 5 and 6.

Franklin T. Griffith, president of the Portland Electric Power Company, Portland, Ore., is in the East for a few weeks on business for the National Electric Light Association of which he is president.

General George H. Harries, who preceded Wm. F. Raber as the temporary manager of the San Diego Consolidated Gas & Electric Company, San Diego, Calif., will remain on the Pacific Coast, having general supervision of Byllesby properties.

James M. Perlewitz, who was recently promoted to the position of sales manager in charge of the Salt Lake City branch of the Western Electric Company, was born in Lansing, Ill., Oct. 9, 1887. He was educated in the grade schools in Chicago and the high school at Pueblo, Colo., in addition to special private study. In 1906 he went to Salt Lake City and three years later entered the employ of the Western Electric Company in that city. In 1910 he was transferred to the Rocky Mountain Bell Telephone Company, and the following year went back to the Western Electric Company's Salt Lake City office. He

JAMES M. PERLEWITZ

left there in 1919 to enter the electrical business in Rexburg and Idaho Falls, Idaho. In 1922 he again returned to the employ of the Western Electric Company in Salt Lake City. His training has been largely along the line of handling sales work. On Aug. 1, 1924, he was promoted to his present position, to succeed A. J. Calloway, who was transferred to the company's Indianapolis, Ind., office.

Frank J. McEniry, formerly field representative of the Denver Electrical Cooperative League and recently appointed publicity manager of the General Electric Company's radio station at Denver, Colo., is spending some time at Schenectady, N. Y., preparatory to taking up his new work.

H. H. Courtright, manager of the Valley Electrical Supply Company, of Fresno, Calif., attended the recent meeting of the Advisory Committee of the California Electrical Cooperative Campaign held at San Francisco Aug. 29.

Obituary

Charles Brown, head engineer on the Hetch Hetchy project, was killed in an automobile accident on Sept. 2. Mr. Brown had been connected with the Hetch Hetchy project and San Francisco municipal engineering since 1921 and at the time of his death was resident engineer and superintendent of construction at the Moccasin Creek power house.

Max Herskovitz, president of the Peerless Light Company, Chicago, Ill., died Aug. 10.

Trade Outlook

San Francisco

Recent orders for electrical material included nine carloads of fibre conduit for a northern California power company and $10,000 worth of porcelain insulators for a southern California power company. The awarding of a contract to a local electrical contractor aggregating $148,000 for electrical work on the telephone company's new building in San Francisco was the center of interest in the electrical contracting field. August sales showed considerable increase over July, and renewed activity in the electrical market is reported. Retail trade has been somewhat dull, but special sales have tended to stimulate it. Within the past two weeks active inquiries have been received by manufacturers for apparatus to be stocked. Since no equipment has been purchased for stock by jobbers and dealers for about a year, this is considered encouraging.

In other lines of business there appears to be a better feeling as fall approaches. Annual market week brought a large number of buyers with a consequent stimulation of sales, and activity among manufacturers indicates increased buying for future delivery. Local paint manufacturers report business good. Building continues active; collections have improved. Bank loans are available for legitimate needs.

The Railroad Commission has reported the net operating revenue of electric light and power companies operating in the State of California amounted to $39,595,270.15 for the year 1923 as compared with $29,273,867.23 for 1922.

Seattle

Encouraging reports from the lumber industry continue, and there are good prospects that the demand now apparent for lumber products will continue to grow and that the fall and winter volume of new business will be heavy. Reports from the agricultural sections of the state show a prosperous condition, with prospects of satisfactory prices and market for crops. Retail trade is reflecting a quickened demand. Gradual improvement is expected with the return of vacationists to the city.

Seattle electrical jobbers, as a whole, report that the recent sales volume shows a slight increase, with indications that the gain will continue. Following the vacation period, domestic appliances are moving in larger volume, sales along this line including washing machines, irons, electric tableware, etc. Contractor-dealers have bought heavily of wire, boxes and schedule material, and demand from this source will remain active as long as building continues at present levels.

Inquiries are being received from farming districts for farm lighting units, and there has been a number of calls for equipment from lumbering and industrial plants. Prices are tending upward, although no important changes are noted. Stocks are good.

Los Angeles

The electrical industry in Los Angeles and vicinity showed a slight improvement during the month of August over the preceding month. This is true more of the retail business, however, than of the wholesale, while manufacturers continue to report more good business prevailing in their lines and on a par with preceding months. While the electrical supply business for wholesalers has not shown much improvement, business continues to be good though somewhat under the 1923 record. On the other hand, those wholesale electrical concerns handling radio material are having a very good market, and this is tending to hold up the volume of sales. Electrical retailers report an increase over the low point which was reached during the month of June, and business is going along in a satisfactory manner. This is true in radio departments.

Building acitvities, while under the 1923 record, are considerably in advance of 1922. In the agricultural industry, crops are not as large as they have been during recent years, but it is expected that with the present prices the monetary value will be about the same.

Portland

Lumber demand, retail sales, building permits, car loadings, wholesale trade, bank clearings, collections and postal receipts all show improvement during the past month.

Probably the most encouraging thing is the revival of the lumber business. There has already been a substantial raise in prices and further increases are expected shortly. About 90 per cent of the mills of the Northwest are operating. New orders are coming chiefly from the East and Middle West, though quite recently the California markets showed some improvement. Motor-operated mills in Portland consumed about 10 per cent more energy during August than they did a year ago.

Water cargoes from Portland to Atlantic Coast ports have increased rapidly during the past year. Foreign wheat and flour shipments for August showed a sharp decline over 1923, while lumber is far ahead of August, 1923, except to Pacific Coast points.

Salt Lake City

Increased employment is noted in seasonal agricultural pursuits throughout this section. Building, municipal improvements and highway construction are also active. The canning season is under way, which adds temporarily to increased industrial activity and furnishes employment to a large number of people.

One of the most encouraging factors in the business situation is the healthy condition of the mining industry, due to favorable metal prices. Improvement of both the actual price and the general outlook for copper is one of the most important developments of recent months so far as the Western mining states are concerned.

Jobbers report somewhat of a slump during the past two weeks, but nothing of an unusual nature for this season of the year. Collections are fair.

Probably the most important merchandising event during the month of September is the Utah Power & Light Company's campaign on kitchen lighting units. This is one of the most intensive campaigns in the company's history, and excellent results are reported thus far, with splendid prospects for the balance of the month. There is continued increase in commercial lighting activity, with improvement in the class of wiring in residences and increase in demand for convenience outlets.

Spokane

The Spokane Interstate Fair held during the week of September 1 brought the usual number of visitors to town, with a stimulation of retail trade as a result. It seems to be the feeling of local merchants that the automobile trade has been especially favored this summer at the expense of other lines.

Industrial activities on the whole are normal, with most of the woodworking plants running at a good output. The railroad shops are working at a level slightly under that of 1923, due in part to the smaller traffic in fruit and grains this year. The packing business, as reported previously, is characterized by large gains this year, and the local market for live stock continues excellent. On account of the decrease in harvesting requirements, there is more unemployment than usual.

Mining activities in British Columbia and northern Idaho continue at the high level that has characterized this whole year. The prices of lead and zinc are holding up, and any increase in price of copper will have a beneficial effect upon producers in British Columbia and Montana.

Denver

Oil development continues to be the chief subject of interest in commercial circles of this region. Reports of progress in the various Colorado fields are most encouraging, according to experts. Indicative of the development is the present negotiation for rights to construct and operate a pipe line from the northwest fields to Denver through the Moffat tunnel now under construction. With this assured, several large refineries would be built in this city.

Shortage of water has harassed the farmers in several sections, especially those specializing in garden stuff. Lack of rain in the mountains has created a condition extremely conducive to forest fires and considerable damage has resulted. Hydro plants as yet have not been forced to reduce operations.

Output of the gold mines is increasing monthly. Coal mining is opening gradually although the present warm weather does not insure domestic consumption to any marked extent for several months yet.

Building in Denver during the past month continued extremely active. Labor conditions are good. Increasing sales are reported by retail stores, although clothing and automobile dealers are still pessimistic. Appliance and radio sales are holding their own with splendid prospects for the fall months.